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Planned for Expansion in Three Directions

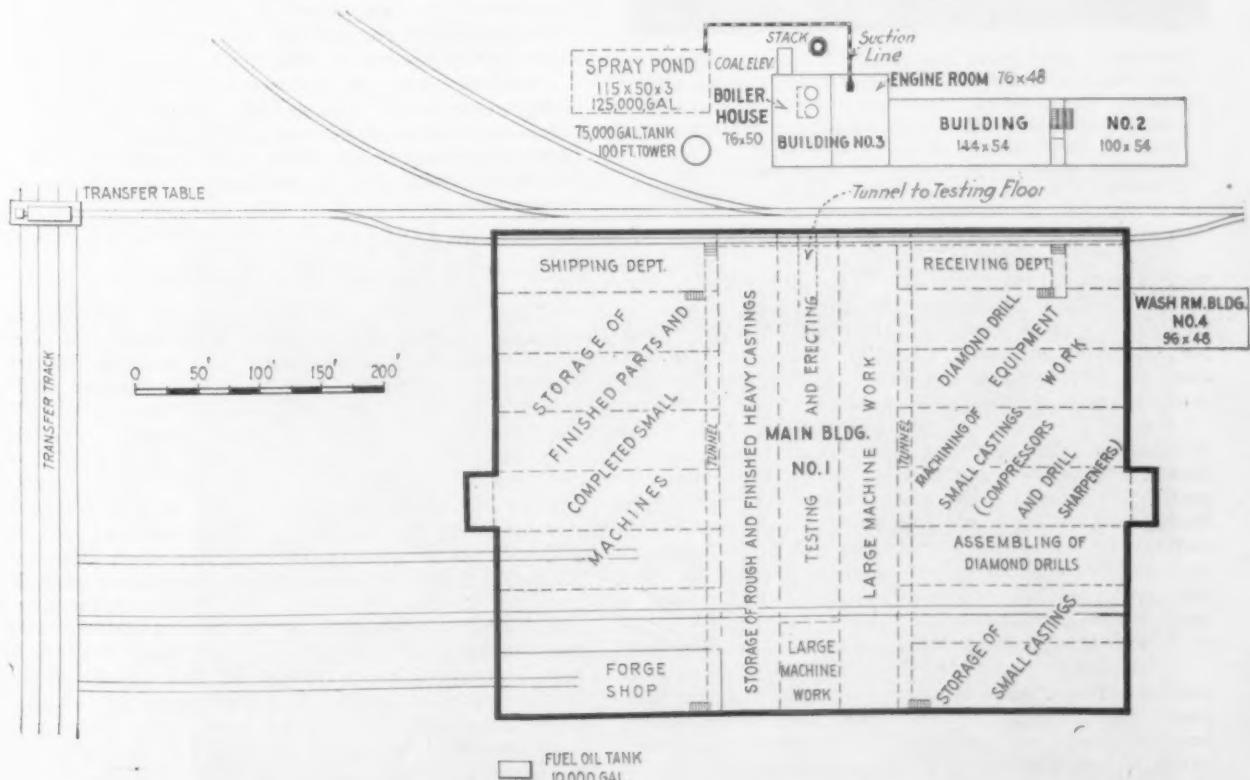
New Plant of Sullivan Machinery Co. Anticipates Future Growth—Layout and Equipment Show Careful Attention to Manufacturing Details

BY GILBERT L. LACHER

A MANUFACTURER who supplies equipment to rapidly growing basic industries must give careful consideration to future expansion in selecting a site and erecting a new plant. The Sullivan Machinery Co., maker of air compressors and mining equipment, for many years located in Chicago, was recently brought face-to-face with this problem. Originally its facilities in that city were confined to a warehouse and a repair and service shop, but in 1900 it purchased the plant and business of the M. C. Bullock Mfg. Co., manufacturer of diamond drills and mine hoists, at West Lake Street and Talman Avenue. In succeeding years its Chicago output increased steadily until, owing to the overcrowded condition of the works as well as a change in the character of the business, it became imperative to provide new and larger manufacturing capacity.

Exhaustive survey of possible plant sites throughout the Chicago metropolitan district as far west as the Fox River uncovered none which was deemed satisfactory from the standpoint of railroad connections with the East—important in securing prompt delivery of castings, parts and completed machines for stock from the company's works at Claremont, N. H. In fact, during the war it was found that it took fully as long for shipments to pass over Chicago belt lines as to traverse the entire remaining distance (over 1000 miles) from Claremont. The company's investigation also failed to locate a large enough site on which the land valuation was not regarded as inordinately high.

Attention was therefore directed to other points near Chicago and, at Michigan City, Ind., a satisfactory location was discovered. Here 120 acres situ-



Laid Out for Expansion on Three Sides, the Three Middle Longitudinal Bays May Be Extended Southward to a Maximum Length of 1600 Ft., Making it Possible to Add More Lateral Bays on Each Side. The lateral bays, likewise, may be extended east and west until the width of the plant reaches 1300 ft. A tunnel system under the factory obviated the necessity of building a basement. A separate structure houses the power plant, pattern shop and storage, drafting room and offices

ated on the Pere Marquette Railway were bought for less than the price of one acre in many industrial districts in and around Chicago. Transportation facilities, moreover, were found ample, as Michigan City is served by three other railroads, the Monon, the Michigan Central and the Lake Erie & Western, the freight houses of which are less than 15 min. by



A New Type of Rack Has Been Set Up in the Receiving Department for the Storage of Heavy Bar and Pipe Stock. The important feature of the rack is that it is open at the top so that large bundles of bars or pipe may be lowered into it or removed from it by the overhead crane. The connecting cross pieces are removable and are hung in place merely to separate given bundles of material.

motor truck from the site. This municipality also fronts on Lake Michigan, and the Sullivan management hopes some day to avail itself of water transportation for shipments to foreign destinations—dependent, of course, upon the deepening of the St. Lawrence River and connecting canals.

Among other factors which influenced the decision to locate at Michigan City was the labor problem. In Chicago, employees spent from 45 min. to one hour each morning and night going to and from work. At Michigan City it is possible for them to live within walking distance and thereby save 1 to 2 hours per day, which they can devote to their homes. Building lots are materially cheaper in Michigan City and a comfortable dwelling house with a large garden plot is within the means of any industrious workingman.

Ground was broken for the new plant in July, 1922, and manufacturing operations were started in the completed factory Aug. 1, 1923. The site was a heavily wooded tract, and as many trees as possible were saved to preserve the natural beauty of the setting. The layout of the plant is unique in that it permits expansion on three sides of the main manufacturing unit. So as not to interfere with later expansion of manufacturing facilities, the power plant, pattern shop, drafting room and office building are housed

in a separate structure divided from the plant proper by a switch track from the Pere Marquette Railway.

Only the side of the plant fronting on the railroad siding is of permanent construction; the other three sides have false walls of hollow tile, which may be removed whenever expansion is undertaken. The present building is 392 x 530 ft., containing over 200,000 sq. ft. of floor space. There are three longitudinal bays used for erecting and testing, large machine work, and storage for rough and finished heavy castings. Arranged at right angles to these middle bays are 16 lateral bays, eight on each side. These are used for machining of small parts, machining, erecting and assembling of small machines, and the storage of rough castings and of finished parts for small machines. One lateral bay is occupied by a forge shop and a wing, projecting beyond two of the side bays, houses a first aid department, lavatory and toilet room.

Allowance for Expansion

Both the lateral and longitudinal bays may be extended singly or in groups as increased space is required. Maximum extension of the lateral bays on each side will bring the total width of the plant up to 1300 ft. As the longitudinal bays are extended in a southerly direction, it will be possible to add additional lateral bays on each side. The total possible length of the plant as defined by present property limitations is 1600 ft.

Maximum space has been conserved for plant expansion through adoption of an ingenious plan which obviates the necessity of laying long-swinging switch tracks to serve the various lateral bays. On the western edge of the property, a track of four parallel rails running north and south carries a transfer table long enough to hold a freight car and a small gasoline locomotive. Thus all of the plant site outside of the present building is available for the expansion of lateral bays, except a strip wide enough to permit the operation of the transfer table. Plans call for the eventual location of similar transfer tracks on the east side. The transfer table, constructed by George P. Nichols & Brother, Chicago, is operated by electric trolley and can be spotted at any one of a number of switch tracks running into the lateral bays. The gasoline locomotive, which is guaranteed to push a fully loaded freight car up a 3 per cent grade, was built by the George D. Whitcomb Co., Rochelle, Ill.

All bays, both lateral and longitudinal, have the same width of 48 ft., so that the electric overhead traveling cranes used are interchangeable. In the north and south spans there is 24 ft. clearance under the crane hooks, and in the lateral bays, 15 ft. The cranes are from 5 to 20 tons capacity, and were all made by the Pawling & Harnischfeger Co., Milwaukee.

Rail and Motor Shipments

There are both inside and outside receiving and shipping tracks. The outside track runs the length of the north front of the plant next to a concrete platform which forms the roof of a tunnel which will be referred to later. On the inside of the north wall is another railroad track of similar length. The shipping department, located next to this track at the west end of the plant, is served by a 5-ton overhead electric traveling crane for loading, and a Toledo automatic scale for weighing. Both railroad car and motor truck shipments are handled from the same platform, trucks finding entrance through a wide door provided for the purpose. The inside shipping and receiving track commanded also by five electric traveling cranes which operate in the three longitudinal bays. Ranging from 10 to 20 tons capacity, these cranes are used to handle heavy materials or equipment from and to railroad cars. The longitudinal bays are connected at the track end of the building by a narrow-gage track carrying a hand-pushed flat car on which materials may be transferred from one bay to another.

At the east end of the plant is the receiving department, arranged for receipt of materials both from railroad car and motor truck. Here, as in the ship-



Long-Swinging Tracks to the Lateral Bays Were Rendered Unnecessary through the Use of a Transfer Table which Operates on Four Rails on the Western Edge of the Property. Thus all of the site between the plant and the property line is conserved for expansion, save for the space occupied by the transfer tracks. The transfer table, operated by trolley, is long enough to carry a freight car and a gasoline-driven locomotive, which appears at right.

ping department, a large door has been provided for the entrance of motor trucks, and materials are unloaded from railroad cars or trucks by a five-ton overhead electric traveling crane. Weighing is done on an automatic Toledo scale.

A feature of the receiving department is a new type of rack used for storage of heavy bar and pipe stock. The important characteristic of this rack is that it is open at the top so that large bundles of bars or pipe may be lowered into it or removed from it by the overhead crane. In brief, the rack consists of two parallel rows of channel posts anchored in the concrete floor. Each post is made up of two channels held together with bars riveted to the webs. No permanent connecting cross pieces join the posts, but removable cross pieces, hooked on the bars just referred to, serve to separate given bundles of bars or pipe. This arrangement facilitates the rapid handling of large lots of heavy material.

Stock in the smaller diameters, which is used in a greater variety of sizes, is stored in the usual type of rack, from and into which material must be handled from the end. At a given distance from the storage racks a broad white line has been painted on the floor, beyond which the aisles are kept clear for the passage of industrial trucks. For inter-bay material handling the plant has storage battery trucks, furnished both by the Automatic Transportation Co., Buffalo, (the

lift type) and the Baker R. & L. Co., Cleveland, these being equipped with small cranes.

The saw-tooth roof has 40 per cent more glass than is usual in the skylights of manufacturing plants. The decision to provide a maximum amount of skylighting, as well as continuous sash in the side walls, was dictated by the conviction that no artificial lighting is so satisfactory as natural illumination, and that the extra cost of the skylight construction would be repaid many times over in better work. The opening and closing of the skylights is controlled by motor. In case of storm all skylights may be closed simultaneously from a centrally located switchboard.

The floor is concrete overlaid with wood blocks. This surface is easier on the employees' feet than a concrete floor. Furthermore, the constant running of trucks on a cement floor is bound to destroy the surface, which cannot be successfully replaced. The wooden floor, moreover, saves products from bruising and breakage. Likewise, experience shows that it means less wasted time by employees, for men working on a hard floor invariably supply themselves with wooden platforms upon which to stand when operating machines. Consequently, when they must remove the platforms for the floor sweeper, this generally means a suspension of work until the sweeper has left.

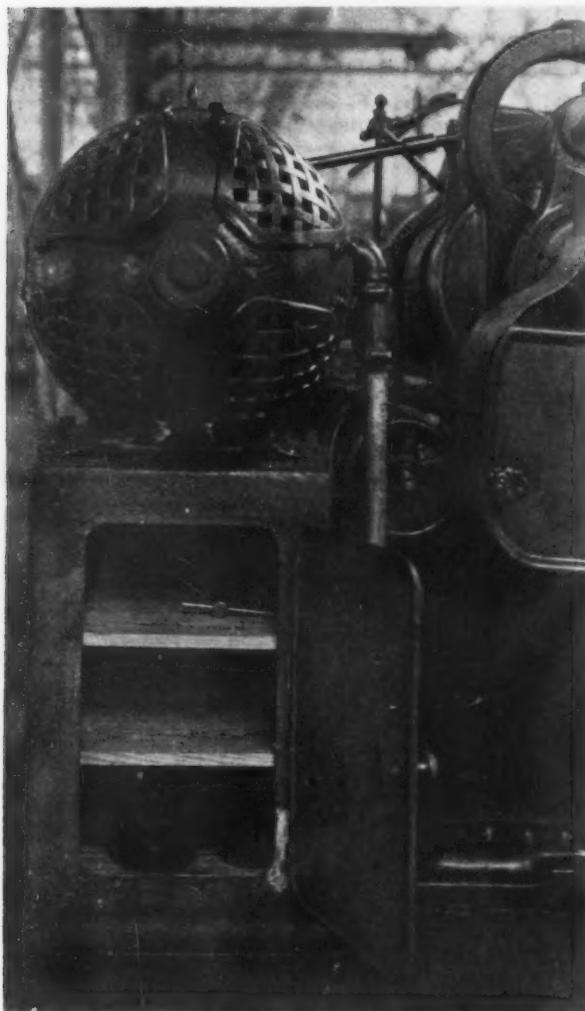
But the greatest advantage of the wood block floor is the fact that it relieved the company of the necessity



All Electric Conduits and Pipes for Lubricating Fluid are Laid on the Cement Floor under a Layer of Wood Blocks. The electric conduits connect with downcomers on the columns supporting the roof, while the pipes for the coolant lead from the various machine tools to a trench located on the long side of each bay. In the illustration are shown coolant pipes in one of these trenches, the flooring blocks being temporarily removed.

of building a basement. All conduits for electric lighting, power and lubrication are laid on the surface of the cement floor and under the wooden blocks. The electric conduits connect with downcomers located on the columns supporting the roof, while the lubricating conduits connect with trenches situated on each side of the lateral bays and at the intersections of the lateral and longitudinal bays. This arrangement permits the location of machines at any point desired. It is obviously easy to remove the wooden blocks to lay new connecting conduits. The great economy effected through this plan is indicated by the fact that a basement under the entire plant would have cost more than the roof.

Lubricating fluid used in all machine tools is returned to a single system serving the entire plant.



For Older Types of Machines Tools not Built for Individual Motor Drive, a Standard Type of Motor Stand Has Been Provided. The stand serves also as a tool box.

Through the pipes in the trenches previously referred to the coolant is returned to a settling tank, whence it passes to a reservoir, from which it is redistributed through the system by means of a centrifugal pump. The supply is replenished from time to time from a mixing tank in which the special fluid supplied by the lubricating manufacturer is mixed with water and boiled.

These three tanks are located in one of a series of tunnels situated under the plant. The one main trunk tunnel extends the length of the north front of the plant, underneath the outside loading platform. Joining it at right angles are two branch tunnels, one on each side of the middle longitudinal bays, extending to the south end. Two additional branch tunnels will be built from the trunk tunnel when the plant is expanded east and west. When the building is extended toward the south the branch tunnels will be lengthened accordingly. At the middle of the north front of the plant the trunk tunnel is connected by tunnel with the power plant.

In the tunnel system are carried conduits for steam, compressed air, lubricating fluid, water, oil and electricity. The electrical conduits are painted different colors to distinguish the different currents: Red designates 440-volt alternating current; blue 220-volt d.c.; yellow, 110-volt a.c.; and white, 110-volt d.c. This method of identifying the currents serves both economy and safety. In plants where no such scheme is used, it is often found necessary to trace a conduit all the way back to the source of power before tapping a line. Red, the color generally used to indicate danger, was designately selected for the 440-volt current to prevent tapping without proper precautions. The color forewarns the workman that he cannot safely make a temporary tap on the line by cutting the insulation with a jack-knife and hanging a wire connection on the conduit.

The plant is heated by steam under vacuum, the steam being distributed by means of the tunnels and from them by piping to radiators appropriately placed around the walls and between the bays.

Handling Lubricants

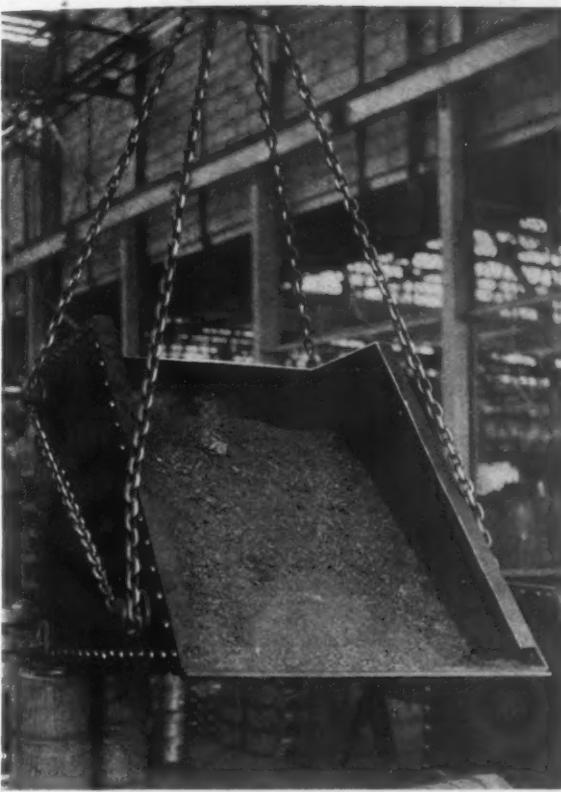
Lubricating oils are stored in tanks in a fireproof chamber in the trunk tunnel at a point approximately midway between its extremities. The tanks are filled through funnels from barrels delivered on the outside platform forming the roof of the tunnel. At a central point on the floor of the plant are individual hand pumps by means of which the different kinds of oils are drawn from the tanks as required. The quantities of these oils used in operations are so small that an elaborate system of distribution such as is provided for the lubricating fluid is not warranted.

The variety of products manufactured in the plant precludes extreme specialization in metal-working equipment. The output includes both steam and motor-driven angle-compound air compressors, diamond core drills and incidental equipment used for mineral prospecting, drill steel sharpening machines, coal cutter bit sharpening machines, and mining drill steel. Orders for these various products are not always in the same relative volume; hence the operations of the factory must be sufficiently flexible to adjust themselves readily to the varying demand for this or that group of materials. Hard and fast departmentalization is out of the question. Single purpose machines cannot economically be employed. The most that could be done was to install machine tools approaching the special purpose type but still retaining universal features. On the whole, however, the equipment and the problems of the plant are similar to those of a shop for mixed manufacturing.

Manufacturing economies are obtained not so much through repetitive operations on especially equipped machines as through proper planning of the work before it passes through the shop. To this end the so-called Gantt system is used, according to which each successive machining operation involved in making the company's products is listed and illustrated by appropriate drawings. Hence, after given orders have been received, similar or identical operations on different products are grouped together, so that machines can be employed continuously for a maximum period with a minimum change of tooling. Thus the productive hours of the plant are planned in advance, the output per machine tool is increased and the time of mechanics is conserved.

Machine Drives

While practically all the machine tools are operated by individual motors, a number of single pulley drive geared-head lathes are run from a single line shaft. As these machines do not require counter shafts, this method of operation is more economical and practically as satisfactory as through the use of separate motors for each machine. A number of machines which were not built for separate electrical drive are driven by belt from individual motors fastened to standard stands constructed by the company, these stands having shelves on the interior for the storage of tools. Separate electric light fixtures attached to all machines assured the best of artificial illumination. Jib cranes equipped with air hoists, located at frequent intervals in the side bays, facilitate the handling of work.



Standard Boxes Devised by the Company Are Distributed Throughout the Plant for the Accumulation of Borings and Turnings. There are enough of these boxes so that, when filled, they will make up a carload shipment. They are emptied into railroad cars by overhead crane. This scheme eliminates the necessity of conveying scrap to an outside dump pile and then rehandling it when loading cars for shipment

In the longitudinal bay adjoining the east lateral bays are located the heavy tools used for large machine work. Among them is a Pond planer, 101 in. between housings and 45 ft. long and with a height of 87 in. under the cross rail. Another Niles-Bement-Pond planer is of nearly the same size. A third large machine is a Niles-Bement-Pond vertical extension boring mill, taking 10 ft. 6 in. under the point of the tools and swinging a piece 20 ft. in diameter. Another extension boring mill of the same type is being installed.

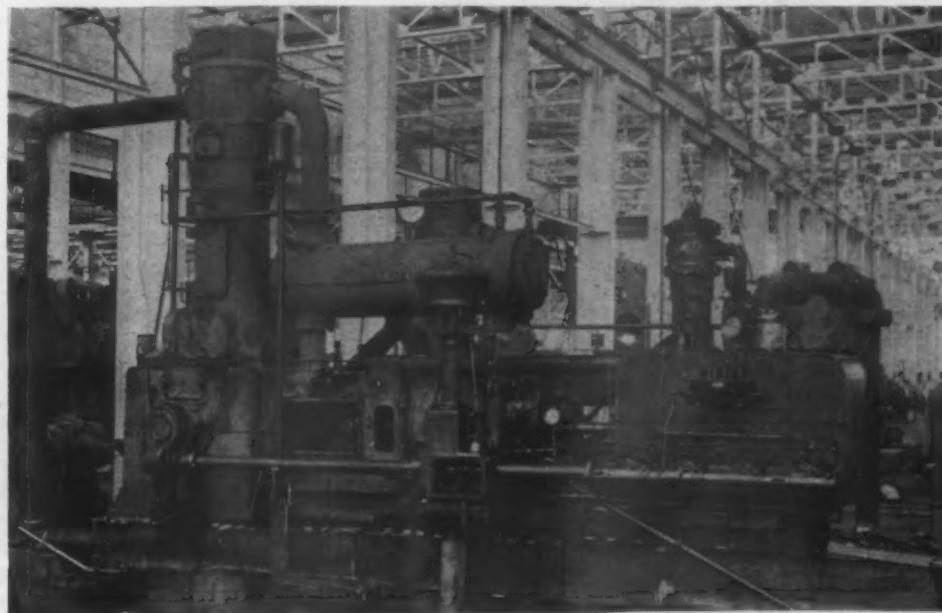
The system of disposing of borings and turnings is worthy of note. Special steel boxes, designed by the company, open at the top and on one side, are distributed at convenient points throughout the various machine shop departments. Enough of these boxes

have been supplied so that when they are all filled they will make up a carload ready for shipment, being emptied by overhead crane. This method of handling chips and borings not only obviates the necessity of gathering the material from the various departments and conveying it to an outside storage pile, but also avoids a second shoveling of the material from the storage pile to railroad cars. It also has the advantage of protecting the material from the rust which it accumulates when exposed in an outside storage yard.

The forge shop is located in the lateral bay at the southwest corner of the plant. The equipment includes three steam hammers—a 1400-lb. and a 500-lb. built by the Niles-Bement-Pond Co., and a 100-lb. hammer made by the Sullivan company itself, together with various oil and coal-heated forges, the largest of which is a Mahr oil-heating furnace for heavy forgings, which handles billets up to 14 in. square. The coal forges will be converted to oil. All of the forges are overhung with hoods through which the smoke and fumes are drawn off through conduits under the floor to a single stack at the corner of the building. Draft is supplied by an electrically driven suction fan. As the shop has a 5-ton traveling crane, it was impossible to run stacks from each forge hood to the roof. The hoods coupled with the suction system keep the forge shop atmosphere as clean as that of any other section of the plant—a most unusual condition, when one considers the heavily beclouded air generally found in forging plants. The motor-driven crane is controlled from the floor, to facilitate the handling of material to and from the steam hammers.

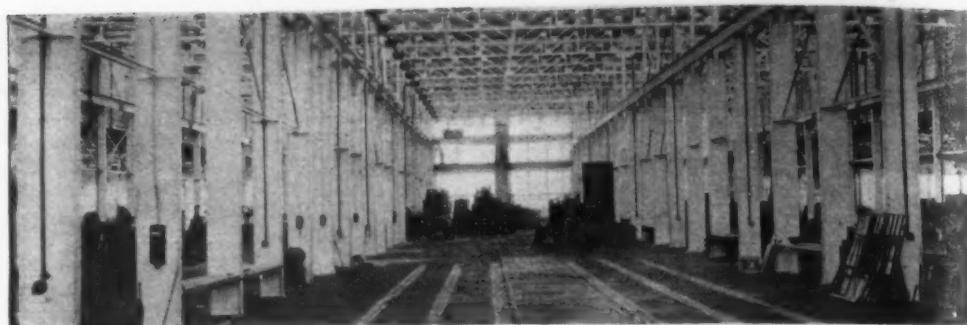
Motor-generator sets, located at a central point in the longitudinal bays, were placed as near as possible to points of consumption, to avoid the heavy cost of running all conduits to the power house. For all new variable speed motors, 440-volt 60 cycle three-phase alternating current is converted to 220-volt direct current. For old variable speed motors, the conversion is to 110-volt direct current. The 110-volt motors, however, will be replaced by 220-volt motors as rapidly as is practicable. In the erecting bay also is located a testing motor for testing at 15 per cent overload, before shipment, all electrically driven machines. Here also steam-driven compressors are tested before shipment for speed, load capacity and steam consumption efficiency. Extreme care in assembling, inspection and testing is dictated by guarantees which cover all machines made by the company. Steam, compressed air, cold and hot water needed for the tests are carried to the testing bed by a short branch from the trunk tunnel.

The same engineering acumen exercised in the arrangement and equipment of the manufacturing plant proper also made itself felt in the power plant. Two vertical 500-hp. boilers built by the Wickes Boiler Co., Saginaw, Mich., have chain grates supplied by the



A Steam-Driven Air Compressor Undergoing Test Before Shipment

The Testing Floor Is Located in one of the Long Middle Bays. The wooden planks shown in the illustration cover a tunnel in which all connections for testing are carried. These include electrical, air, water and steam conduits



Green Engineering Co., East Chicago, Ind., and automatic devices for weighing coal and for measuring feed water. Handling coal from railroad car to the boilers is accomplished entirely without hand labor. The contents of hopper cars are discharged by gravity into concrete coal bins situated directly under a railroad siding, while gondola cars are unloaded by a one-ton Pawling & Harnischfeger gasoline-driven caterpillar crawler crane. Reserve stocks of coal, particularly for winter use, are piled at one side of the track and the crane transfers coal from pile to bin as needed. The crane is also useful for miscellaneous material handling work elsewhere on the plant grounds. The caterpillar type of traction permits it to move easily to any location, regardless of the roughness of the ground surface.

Coal is conveyed from the concrete storage bins by bucket elevator to a bin located at the top of one end of the boiler room. It is then discharged by gravity to a smaller traveling hopper equipped with scales for weighing. This hopper is thereupon shifted to position over one or the other of the two boilers and the contents are emptied through a chute to the chain grates. Ashes dropped from the grates are blown into an ash house on the track side of the power plant. Periodically gates on the side of the house are opened and ashes are discharged into gondola cars spotted on the track outside.

Steam generated by the boilers drives two 400-hp. engines built by the Ames Iron Works, Oswego, N. Y. These in turn drive two General Electric Co. 250-kw. generators. Other equipment in the power plant includes a 20 x 20 x 12 x 14-in. "WD" angle compound direct flow steam-driven Sullivan air compressor delivering 1138 cu. ft. of air at 225 r.p.m., and a surface con-

denser made by the C. H. Wheeler Mfg. Co., Philadelphia. This condenser is used in testing steam-driven air compressors in the erecting shop. Condensing water is discharged through a spray system into a cooling pond having a capacity of 125,000 gal. and is returned to the boilers by a 1000-gal. Dayton-Dowd two-stage centrifugal pump. A 75,000-gal. tank on a 100-ft. tower serves an automatic fire sprinkler system distributed throughout the buildings.

Built of structural steel and reinforced concrete with a facing of brick, the power plant, 76 x 98 ft., adjoins the office and pattern shop building, of similar construction. A section of the latter structure, 54 x 144 ft., is occupied by the pattern shop on the first floor, with pattern storage in the basement, and by a lunch room and dormitory above. Provision of a temporary dormitory was necessitated by shortage of lodging facilities for men who moved from Chicago to Michigan City. Of the 300 employees, fully one-third were in the service of the company at Chicago. Adjoining the pattern department is a section 54 x 100 ft., the first floor of which is occupied by the offices, the second by the drafting room and the basement by a locker and wash room. Future expansion of the pattern shop and storage facilities and of the office space can be taken care of by extending the building 200 ft. to the eastern edge of the property.

The layout and equipment of the plant embody the ideas of S. T. Nelson, superintendent, who has been identified with the company continuously for 38 years. Arthur S. Coffin, Chicago, who has been the company's architect for 25 years past, was in charge of design. The Kenwood Bridge Co., Chicago, fabricated the structural steel used in the buildings. The Wither-spoon-Englar Co., Chicago, was the general contractor.

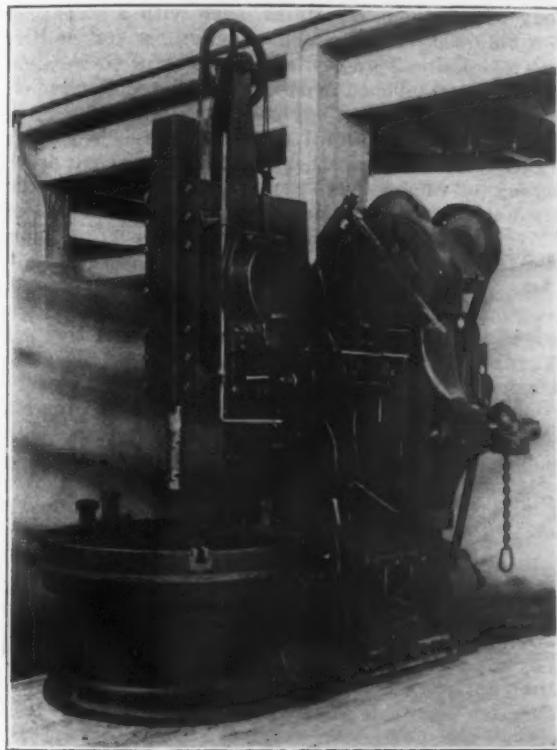


All Forges in the Forge Shop Have Hoods to Draw Off Smoke and Fumes, Draft Being Supplied by an Electrically-Driven Suction Fan. In the foreground is a coal forge and beyond it an oil-fired heating furnace. At the right are two steam hammers

New Car Wheel Boring Machine

An automatic chuck and independent power rapid traverse to both boring and facing spindles, intended to permit the workman to perform all the operations with the least amount of labor and in the quickest time, are features emphasized in the new car wheel boring machine developed by the Betts Machine Works of the Consolidated Machine Tool Corporation, Rochester, N. Y.

The machine is shown in the accompanying illustration. It has a capacity for boring wheels from 10 in. to 42 in. in diameter, the table being 52 in. in diameter. It is available either with or without the facing head for finishing hubs. The boring spindle is of heavy rectangular section. The facing spindle



Car Wheel Borer. The automatic chuck and independent power rapid traverse to both boring and facing spindles are features

is self-contained in the frame of the machine and has a bearing in a square guide on the under side of the frame, thereby supporting the facing tool close to the cut. The facing tool slide has vertical adjustment sufficient to accommodate wheel hubs of various heights. The power rapid traverse is independent to both boring and facing spindles so that rapid traverse may be used on one while feed is being used on the other. This feature is intended to permit of raising the spindle quickly by power when the wheel is bored, by simply throwing the rapid traverse lever in the desired direction.

Six feeds to both heads are provided, these being obtained through selective sliding steel gears which may be changed while the machine is running. In operation, when the roughing cutter is through the wheel, the operator throws the proper feed lever, thereby throwing in the finishing feed without stopping the table. Two-in-one boring tools can be used to advantage. The boring spindle is equipped with a counterbalance weight so that it may be raised and lowered by hand if desired, for making close adjustment. When the spindle is elevated the counterbalance weight enters a chamber in the frame.

The automatic chuck is controlled by a reversing friction clutch so that it is unnecessary to stop or reverse the motor when closing or opening the chuck. When the driving clutch is thrown in the table starts to rotate and the jaws move toward the center, gripping the wheel with the full driving force of the motor. The heavier the cut the tighter the jaws will grip.

When the bore is finished, the table is stopped by means of a band brake operated by foot treadle. The clutch is then thrown to the reverse direction, causing the jaws to open instantly, without stopping the motor. The band brake also permits the operator to stop the table and caliper the bore of the wheel without danger of loosening the grip of the jaws on the wheel.

Four table speeds in geometrical progression are obtained through hardened steel sliding gears located in the base of the frame where they run in a bath of oil. Either mechanical or pneumatic hoist may be provided, the mechanical hoist being driven by belt from the main drive shaft. Control levers are located on the right hand or operating side of the machine.

Bankruptcy Suit Against McKeeffrey Iron Co.

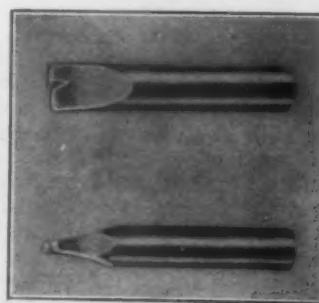
An involuntary petition in bankruptcy against the McKeeffrey Iron Co., Leetonia, Ohio, has been filed in the United States District Court in Cleveland by the Producers' Coke Co., which claims that the McKeeffrey company has debts to the amount of \$500,000, and that it owes the petitioner \$50,000. The coke company declares that the McKeeffrey company is insolvent and that while insolvent it transferred a portion of its assets to some of its creditors making them preferred creditors, by executing a chattel mortgage Aug. 13, 1923, to J. B. Lane, trustee, to secure debts of \$608,000 to the First National Bank, Pittsburgh, \$202,000 to McKeeffrey & Co. and \$87,020 to the Hillman Coal & Coke Co. The petition states that this mortgage covered certain stocks of pig iron including 14,000 tons stored at Leetonia. At various times large sums have been paid on account of the indebtedness covered by the mortgage, according to the petition.

New High-Speed Steel Cutters

High-speed steel cutters of the type illustrated, for cutting keyways, slots and oil grooves, for machining flat-bottom holes, facing, cutting deep slots in dies, and for similar use, have been placed on the market by the Economy Products Co., 50 Spring Street, Newark, N. J.

The arrangement of the cutting edges is intended to provide free cutting action without impairing the accuracy of the surface produced, the edges being said to permit of removing the maximum quantity of metal without injuring the cutter or overloading the machine. It is claimed that less friction is generated while cutting, leaving the teeth cooler and capable of more work between grindings than other types of end mills. The

High-Speed Steel Cutters for Keyways, Slots, Oil Grooves and Other Work. The arrangement of the cutting edges is a feature



tools may be quickly resharpened on an ordinary emery wheel and are said to retain the original diameter after resharpening.

The cutters are available with straight shank in diameters from $\frac{1}{8}$ to $\frac{1}{2}$ in. inclusive, and with taper shanks from $\frac{9}{16}$ to $1\frac{1}{8}$ in. diameter.

The Sloss-Sheffield Steel & Iron Co., Birmingham, Ala., has appointed as its sales agent in the New York and Boston territory the Debevoise-Anderson Co., Inc., No. 114 Liberty Street, New York, and Exchange Building, Boston. L. C. Cleary, formerly president of the L. C. Cleary Co., is now associated with Debevoise-Anderson Co., Inc., and will be in charge of its iron ore department.

Vital Problems Which Confront the Country

Radicals in Congress Block Legislation While the Public's
Time Is Wasted—Taxation, Bonus, Immigration
and Other Subjects Demand Attention

BY JAMES A. EMERY

THE sixty-eighth Congress recessed from Dec. 20 to Jan. 3. During its brief period of operation, a small minority of 25 legislators successfully obstructed the organization of the committees of the House until substantially the end of the recess period. The Senate, during the same interval, appointed its standing and select committees, but was prevented by a tenth of its members from naming a chairman for the important Committee on Interstate Commerce. The volume of new legislation has assumed great proportions. Some 5500 bills have been introduced in the Congress, together with 36 proposals for amendment of the Constitution.

It may be instructive to examine not merely the proposals and policies most likely to receive major consideration but the changes in political condition and circumstance under which the present Congress will act.

Under our theory of government, we presume that the responsibility for public policy is to be collectively accepted by the party in power, subject to the intelligent and telling criticism of an informed and well-organized minority party. But, unfortunately, parties have gradually lost control of their membership under a system of dissipated power which, aiming at lessening the dangers of a party machine, has resulted in creating a number of irresponsible individual political machines. Thus a number of popular individuals, due

to local conditions in their respective states or an exceptional capacity for personal appeal, become the influential leaders of regions, sections or groups. We have, in policies for popular approval or disapproval, a body of rebellious chieftains, each with a stronghold and a following from which he emerges for political forays; a political guerrilla too powerful to be disciplined by a weakened party, accepting collective responsibility only within narrow limits and too securely entrenched within his local refuge to be reached by the outraged electorate of other states. The result is the lessening of the collective responsibilities of parties to the nation and a magnification of the power of local and regional political leaders without corresponding public responsibility.

You witnessed recently an illustration and climax of these conditions in the reaction of the national legislators of his party to the definite and constructive proposal for tax reduction presented by one of the ablest financiers who have held the treasury chair since the days of Alexander Hamilton. We perceive the apparent paradox of senators and representatives approving the plan, yet declaring it impossible of political execution. They admit its need, they laud its terms, but confess that party organization is too enfeebled to rally the forces of the administration to its execution.

Imperative Necessity of Political Parties

WITHOUT thought of either party, but firmly convinced that the successful operation of popular government requires two major political organizations, I feel the public leadership of the nation could perform no greater service than to join in preaching to a confused America the essential necessity of political parties as the indispensable agencies to operate our form of government, and both might equally well join in urging every qualified voter to the polls. Unless party authority be restored, there is no means by which majorities can relieve their representatives of destructive compromises, with controlling minority leaders entrenched in the local strongholds of factions, classes and blocs. The evidence of this truth is about to be exhibited in the halls of Congress. The Senate, of 96 members, is composed of 51 Republicans, 43 Democrats and two Farm-Labor senators from Minnesota. It would appear upon the face of these figures that the party responsible for the conduct of government had a majority of eight over its opponent, or six over a Democratic combination with the gentlemen from Minnesota. But,

on the contrary, a group of six nominal Republicans, constituting a radical bloc and operating under the leadership of the gentleman from Wisconsin, accept the benefits of party organization and none of its responsibilities, while rejecting many of its policies. Its leader is the ranking member of two of the most influential committees of the Senate: Finance and Interstate Commerce. The influence of the same small group reaches into the House of Representatives, where a Republican majority of 17 over any apparent combination of the minority party and the Socialist, Independent or Laborite, who might combine with it, are in such close combination with Mr. LaFollette's guardsmen that they may prevent the organization of the House by the apparently dominant party, and leave the responsible administration subject to the working combination within the two Houses, which will make the alleged party in power an administration only in name. These, indeed, are serious considerations, threatening the practical operation of the majority principle in representative government.

Striking Characteristics of the Times

THE desire for change is a characteristic of our time. The willingness to experiment, the search for novelty in amusement, dress or public policy, the lack of respect for experience, the eagerness to embrace the new, the contempt for the old, express themselves with increasing frequency in the affairs of government as in the field of social life. Proposals for amendment of the fundamental law become more numerous with each session of Congress. Including the Sixty-seventh Congress, 3163 amendments to the constitution have been proposed since the adoption of that instrument. The first ten amendments are commonly regarded as part of the original instrument. It could not have been adopted

without the assurance of their submission by the First Congress. Exclusive of these, we have adopted nine amendments to date, four of these within the last five years. We have therefore displayed notable self-restraint in the face of numerous proposals for innovation. The last Congress suggested 104 amendments, more than have been offered in any Congress, save the Thirty-sixth, which convened during a period of extraordinary panic and excitement, and while our early governmental adjustments were yet in the making.

Among those likely to be most seriously urged in the approaching session is the proposal to abolish tax-exempt securities by authorizing reciprocal levies by

the state or nation upon the income of the security issues of the other sovereignty. A second suggestion in which there is wide interest is the so-called Wadsworth-Garrett amendment intended to change the method of proposing and ratifying constitutional amendments. This would require submission by a two-thirds vote of the membership of either house instead of a two-thirds vote of a quorum, which is now the permissible method under decision of the Supreme Court. The amendment would further require that the membership of at least one house of the state legislatures passing upon a proposed amendment should

have been elected after its submission and that any legislature may change its vote before two-thirds of the states have approved or one-third rejected the pending proposal.

These proposals represent important suggestions to safeguard the national revenues and to secure deliberate and thoughtful consideration of and action upon proposed changes in the organic law. Another class of amendments is directly aimed at the control or diminution of the judicial power, and one at least would affect a revolutionary change in our form of government.

Making Courts Subject to Popular Opinion

ONE body of such amendments, for they assume several forms, has been offered with increasing frequency in both State legislatures and the Congress. They are intended either to shorten the judicial tenure of office or to make the appointive judiciary elective, or

astie approval of the American Federation of Labor. It provides that Congress shall have the power to re-enact by a two-thirds vote any statute declared unconstitutional by the Supreme Court. This, of course, while ostensibly aimed at the limitation of the judicial

JAMES A. EMERY of Washington has been counsel of the National Association of Manufacturers since 1905. He has been counsel of the National Founders' Association since 1920, and his annual addresses at its meetings have always commanded the closest attention of the members and received enthusiastic approval. Owing to being engaged in important litigation at the time, he was unable to attend the association's meeting last November and his views on important articles have not become known, but are ably presented in this article. He also is counsel for a number of other national organizations taking an active part in the discussion of the legal and economic aspects of prominent industrial subjects at issue in litigation and legislation.

Mr. Emery was born in Detroit and moved to California in his boyhood. He graduated from the University of Santa Clara with the degree of A.B. and later from the University of California.



both. Their authors frankly contend they will make judges more responsive to public opinion and by giving them short terms of office make them immediately answerable to a constituency for the character of their opinions. They are obviously founded upon a concept of the judicial function which, if widely accepted, would substitute for settled principles of adjudication the changing fluctuations of popular opinion expressed in judicial views calculated to please an electorate rather than to apply to the subject matter of litigation fixed principles of right. Imagine, if you please, a Federal judiciary, candidates for office, upon the same terms as members of Congress, and elected or rejected upon the issue that their judicial opinions, in anticipation, were acceptable or objectionable to the majority opinion of the hour. So that we would have, instead of independent judges selected upon the basis of learning, character and ability, gentlemen whose judicial vagaries were acceptable to groups, classes and blocs, and whose opinions might be anticipated to be political rather than judicial.

The most subversive proposal was that offered by Mr. LaFollette in the last Congress, and which we are assured will be re-introduced. It received the enthusi-

power, would in effect repeal the limitations contained in the Constitution of the United States.

For the Constitution provides a limited government. To 79 grants of power, it attaches 115 prohibitions. With 19 delegations of authority to the Congress, it carries 70 negations of power. If Mr. LaFollette's proposal were accepted it would literally become the only restraint remaining upon the legislature. For if it willed there would be no power that Congress could not assert and exercise, even in the face of a unanimous decision to the contrary by the Supreme Court, provided two-thirds of the Congress joined in repeating the original offense. Every right of the individual to liberty or the fruit of his effort, property, would be at the mercy of the national legislature. Every definition between local and national government could be obliterated. That which was innocent when done could be made a crime by legislation after the fact. Jury trial could be denied, State religion established, speech and publication prohibited, every accused person tried as often as you please for the same offense, despite his acquittal, bills of attainder enacted and private property confiscated. So long as such a proposal were part of the Constitution, no previous

provision could restrain it, and no subsequent amendment control it. The restraints of a written constitution would disappear and we would establish an omnipot-

ent parliament requiring the assent of only two-thirds of its members to employ the power of government for any purpose it pleased, through any method it liked.

Proposed Seven-to-Two Vote in the Supreme Court

ONLY less subversive in its impairment of the judicial power is the more plausible proposal to require a seven-to-two vote of the Supreme Court to hold any act of Congress invalid. In any contest of right involving the power of Congress to act, three members of the court could overcome the majority. The operation of the majority principle would thus cease in the judicial department. However respectable the unanimous opinion of the court of last resort in any State, the confirmation of its opinion holding a congressional act unauthorized would be defeated by the failure of one-third of the justices of the Supreme Court to join in the view. Men forget that as a principle of constitutional construction every argument directed against the validity of a congressional act must overcome the standing presumption that the act is valid. A division in the court does not necessarily mean a division of opinion as to its validity, but may mean merely that the presumptive doubt has not been overcome in the minds of a minority of the court.

The now highly stimulated tendency toward the centralization of Federal authority will undoubtedly express itself in a variety of amendments intended to confer upon Congress the power to deal through Federal bureaus with questions hitherto presumed to be within the exclusive province of local government. Thus proposals will be offered to give Congress at least concurrent power to regulate the labor of persons under 18 years of age, to establish uniform marriage and

divorce laws, to fix minimum wages for women, while bills intended to establish Federal control of education, mental, physical and vocational, lie on the horizon. In addition, we may expect what may be frankly described as the continuing proposals of Socialism, amendments to accomplish the nationalization of the railroads and mines, and the manufacture in Government establishments of munitions of war, the plants to be utilized in peace to meet the many commercial requirements of the public departments. Finally, we shall undoubtedly have a crop of proposals to make amendment of the Constitution easier, to initiate amendment by petition or to secure the submission of proposals by a mere majority vote of Congress instead of two-thirds, or to assure ratification by a majority vote of the States instead of two-thirds.

Many of these proposals, which would merely excite indignation rather than apprehension, receive wider support because there are many evidences that we have a house of delegates rather than one of representatives. Many national legislators frankly declare that they expect to reflect the sentiment of their constituency and admit the conflict between their judgment and what they regard as a prevailing opinion. One may again read with profit the famous address of Mr. Burke to the electors of Bristol, and ask himself how many members of either house would upon occasion assert that famous distinction between the obligations of a representative and the echoing acquiescence of a delegate.

Transportation, Taxation, Bonus and Other Subjects

IN addition to these proposals, which affect the very nature of our Government, it seems likely that the major legislative problems of interest to industry are to be found in the subjects of transportation, taxation, including the bonus, and immigration. The transportation act of 1920 has many critics. The more radical of the agricultural groups continue to insist that the rate clause requiring a fair return within limits upon the physical value of the property is "a guarantee of profits." They will therefore seek to repeal the saving provision that alone assures regulation against the fatal objection of confiscation. The labor organizations are bitterly opposed to the continuance of the Railroad Labor Board, and seek its abolition. Many of the State railroad commissions desire what they describe as a restoration of the powers of State control.

The transportation act is admittedly not perfect, but there is a strong and growing opinion that it is entitled to further trial. The slow recovery from the

effects of Government operation, retarded by the strain of the coal strike and the serious obstructions of the shopmen's strike, have until recently made impossible an opportunity to observe the effect of its operation under fairly normal conditions. Railroad credit essential to equipment and expansion for adequate service has steadily improved. A moratorium in transportation legislation would not only be of public benefit in affording a stable period for further reinforcing essential transportation credit, but it will permit such essential defects in the legislation as exist to be brought clearly to the surface that they may be identified and studied for correction. Whatever differences of opinion may exist as to the minor defects of the act, I submit that neither a fair opportunity has been afforded to appraise its operation under normal conditions, nor is a divided and discordant Congress, on the eve of a national election, the clinic in which to lay its form for a major operation.

Real Issue, Shall Taxes Increase or Decrease?

THE Secretary of the Treasury, by the proposal which he has submitted, has made the reduction of taxation the major policy of this Congress. The issue is no longer whether or not there shall be a soldier's bonus, but whether we shall increase or decrease taxes. Whether all the contributors to the public revenue, who have patiently endured its staggering burdens shall have them lessened and their activities stimulated, or whether we shall add to the discouraging handicaps of the present a vast and uncertain debt, the extent of which is incapable of definition.

The taxes paid in the United States in 1922 aggregated over \$7,000,000,000. They constituted nearly one-eighth of the national income. The National budget system, with the establishment of which the name of the late President Harding must forever be gratefully associated, has been the means of accomplishing almost

unhoped-for economies. But still the local taxes have risen almost in proportion to the reduction of Federal charges. The mania for new regulatory legislation and the expansion of bureaucratic control, in response to the enlargement of administrative law, have enlarged public employment to nearly 3,400,000 persons, and established a public payroll of more than \$3,800,000,000. Every 11 persons over 16 years of age gainfully employed are supporting a public servant. Our billion dollar antebellum national debt rose to 26 billions, and is still approximately 22 billions. Competent authority has estimated that we are facing as a nation an annual deficit in our requirements of new capital of approximately \$2,000,000,000 and, within the next five years, the Government must refund maturing Treasury obligations amounting to \$7,400,000,000.

While the demands upon the taxpayer have steadily

increased, the sources of revenue have been diminished by the multiplication of tax-exempt securities, issued particularly by local governments, by the enlarged exemptions of property from taxation, now aggregating about one-fifth of the national wealth. Furthermore, the rates and the unequal distribution of excise have discouraged investment in reproductive industry, tempted new income and old wealth into the idleness and security of tax-exempt issues, and thus reduced the very revenues which demand augmentation. It is proposed by constitutional amendment to provide that in the future neither the income of local or Federal securities shall escape taxation.

But no amendment which can be offered and passed

will reach eleven billions of tax-exempt securities now in existence, nor does that slow process, if approved, seem likely to afford relief, save partially and in the distant future. We need today a revival of enterprise, a stimulation of individual initiative, an encouragement to investment, which will tempt the withdrawal of refugee capital from the storm cellars into which it has fled and its investment in every form of commerce and industry, quickening our production, enlarging our commerce, multiplying our employment, and utilizing to an ever-enlarging degree our vastly augmented capacity for production, more than 40 per cent of which the Department of Commerce assures us was not utilized in 1921.

Plan of Secretary Hoover Offers Hope

TOWARD this consummation the program of the Secretary of Commerce offers the greatest hope. Against its realization the political insistence upon a soldier's bonus affords the greatest obstruction. What thoughtful man can fail to realize that the immediate beneficiaries of a distributed bonus would be the continuing victims of the depression, the discouragement, which the imposition of further public burdens will almost certainly produce. No other people have more patiently endured over a greater period of time a larger demand for public revenue. Billions of the funds we cheerfully gave are still in the hands of our European creditors, with slight hope of their return. But is not the improbability of reducing that portion of our burden an additional reason not merely for domestic economy but for the application of our savings to the reduction of our taxes?

Nor does the program submitted stop with the lowering of rates, which with respect to the supertaxes is calculated to enlarge rather than diminish the public revenue. It proposes administrative reforms of the most practical importance. It recommends the establishment of a Board of Appeal under the Treasury, but independent of the Bureau of Internal Revenue, which will hear and determine cases involving tax assessment.

Good administration is 90 per cent of a revenue act. A continuing vice of the present law has been the lack of any separation between assessment and collection. We are familiar with that distinction in the operation of real property taxes, and while, under the revenue act the individual or the corporation assesses himself, the final determination of his assessment is at no time separated from the control of the same agencies which enforce collection. The citizen contending with the Government has not only been unable to separate the judicial function of assessment from the administrative function of collection, with its differing viewpoint, but he has been equally unable to find, short of the courts, an independent tribunal of tax appeal which could independently and expeditiously settle his dispute with his Government. The law needs in addition a decentralization of administration which will permit to a larger extent local assessment and settlement through deputy commissioners or a traveling board of appeals which the Secretary's proposal readily permits.

The necessity of traveling great distances, with accompanying loss of time or the expense of employing assistance, has compelled many citizens to submit to tax exactions they believed unjust, a frame of mind which does not make for good citizenship.

Nationwide Support of Secretary Mellon Demanded

A NATIONWIDE support of Secretary Mellon's constructive proposal is our sole hope in the field of Federal taxation. But in the meantime it should not be forgotten that the rising tide of local taxation must be met in our respective communities. Many of the Western states in particular are complaining of tax burdens which can be remedied only by local control of local extravagance. Thus, for example, the States of Utah, Washington, Wisconsin, Arizona, South Dakota, Nebraska and Colorado pay, respectively, Federal income taxes per capita of \$1.88, \$3.02, \$3.41, \$1.07, \$2.25, \$2.57 and \$4.11. In the same States, in the order named, the State and local taxes are, per capita, \$41.45, \$54.80, \$47.48, \$58.76, \$50.07, \$43.48 and \$52.82. I offer these merely as an illustration of the fact that in many instances it is local conditions, subject exclusively to local control, which have vastly increased the tax burden.

The direct corporate burden of taxation is worth nothing. As late as 1915 Federal taxes absorbed but 1 per cent of corporate profits. By 1918 they were taking 33 per cent. In 1921, less than 46½ per cent of the manufacturing corporations could report a net in-

come. Yet these corporations paid more than 50 per cent of the total corporation tax, and this required almost 20 per cent of their net income. In 1913 the steam railroads paid in excess of \$127,000,000 in taxes, but they paid more than \$322,000,000 in dividends. During 1920 and 1922 the taxes exceeded the dividends, while in 1921 the dividends were about \$298,500,000 as against more than \$275,000,000 in taxes.

Such are the facts that point with overwhelming insistence to the essential necessity of carrying through the Secretary of the Treasury's program, if we are to appreciably lessen the unendurable strain upon our social and economic machine. For the prosperous nation is not that which possesses the largest population, the greatest natural resources or the largest volume of money. India and China possess the first; Russia the second; Germany easily leads the world in the ownership of the third. The most prosperous people are those whose boldest and most enterprising spirits are steadily engaged in the efficient development of their natural resources under conditions which stimulate their initiative and assure a fair distribution of the fruits of production among their producers.

Importance of the Immigration Problem

THE immigration problem again confronts the Congress. The 3 per cent quota law, originating in May, 1921, expires, with its amendments, June 30, 1924. The chief measure offered as a substitute for it is the proposal of Mr. Johnson of Washington, chairman of the House Committee on Immigration, which was reported

by the committee to the House on Feb. 9, 1923, but was the subject of no further action. The present per centum act limits, during its operation, the number of otherwise admissible aliens under the act of 1917 to 3 per cent of the alien nationals covered by each quota country shown to be present in the United States under

the census of 1910. This permits a gross annual immigration of substantially 357,000. Mr. Johnson's pending proposal would reduce this to 2 per cent, predicated upon the census of 1890, plus a base quota for each country of 400. The census of 1890 is frankly made the basis of selection in order to discriminate within treaty limits against nations of Southern and Eastern Europe. Under the figures submitted by the committee in its report it would reduce the gross admissible immigration to approximately 187,000, not more than 10 per cent of which would be admissible in any one month, as against 20 per cent in the existing law. It would likewise seriously reduce the quotas of Northern and Western European countries. That of Germany by approximately 15,000; the United Kingdom by about the same; Denmark and Sweden by about one-half; Switzerland by more than a third; France by about the same. The reason for adopting the census of 1890 as the basis of estimate is well illustrated by its effect upon the Italian quota, which would drop from 42,057, under the present act, to 3912 under Mr. Johnson's proposal.

During the three years in which the quota act has been in operation, it has been illustrated that as the law calculates quotas in gross and not net terms, making no allowance for the cancellation of immigration by emigration, it is possible to saturate any quota without a net gain in immigration. Adopting the occupational classifications of the immigration service, the first two years of the operation of the act will show a clear deficit in "common labor." The law has been successful in restricting severely the flow of immigration, as it was intended, and it has met successfully the threat of an inundation of undesirable immigration in the wake of the war, but it has not demonstrated that it provides the basis for a permanent immigration policy or is a desirable substitute for a constructive policy of selective immigration. To adopt a still more drastic quota act, without more careful study of the operation of the present law and its effect upon the future of the United States, will subject us to serious and injurious economic embarrassment. In relation to European countries, it becomes immigration prohibition under the guise of restriction, and in a period of transition from the too liberal policy of the past to the pro-

posed prohibitions of the future, it provides no flexible administrative machinery for practical adjustment.

Immigration is a subject upon which prejudice is easily aroused and the industrial viewpoint quite as easily misrepresented or misunderstood. I believe the manufacturer is as much opposed to unrestricted immigration as to its prohibition under the guise of further restriction. He has a greater stake in the quality of the citizen than in the mere volume of labor. But it cannot be denied that the United States has secured its industrial development in continuing reliance upon a supplemental flow of desirable labor. A study of our needs, the absorbing capacity of our industry and commerce and a comparison of our birth rate with the percentage of those who enter gainful occupations and become a part of our productive agencies, clearly indicate a steady and continuing demand for the reinforcement of our economic and social forces. That need fluctuates. A policy of selective immigration will at once permit it to be met in terms which meet our economic requirements, without lessening the quality of our population. It requires sufficient flexibility in its administration to enlarge or diminish the socially admissible flow in accordance with the demonstrated continuing economic need.

For example, the manufactures census for 1921 will show from the returns of more than 194,000 establishments, constituting 97 per cent of our manufacturing production, that the percentage of actual in comparison with possible output was but 56.8. The utilization of our productive industrial capacity may require, either in the expansion of existing industry or the establishment of new industry, the fundamental aid of desirable immigration, but it cannot be practically regulated in accordance with demonstrated need under an inflexible system of administration.

I believe that the experience of immigration officials has generally led them to believe that the practical enforcement of any selective immigration act and the rendering of practical aid in the instruction, distribution and preparation for citizenship of admissible aliens requires their registration and that of alien seamen and the shifting of the burden of proof of their admissibility under whatever selective test is applied by the Government to the alien applicant.

Family Should Be the Unit of Selection

IT is universally recognized that the family is the unit of society. It ought, therefore, under any immigration policy, to remain the unit of selection. The quota system having been admittedly adopted as a necessary but temporary protection against a threatened flood of undesirable immigration, it ought not to be made more drastic nor adopted as a permanent policy of immigration without critical study of its operation. The general prejudice against commissions, their expense and the natural unwillingness of Congress to permit a subject so highly charged with politics to become the subject of recommendations outside of its membership, suggests that if a permanent policy of selective immigration cannot receive consideration and action in the present session, a joint committee of the membership of both houses might, with profit to the public, study the operation of the present legislation, investigate other aspects of the problem and recommend a permanent policy.

I believe our experience demonstrates that if the quota system is to be continued, it ought to be in net and not gross terms. The latter method of computation overlooks the cancellation of immigration by emigration and affords numerous examples of the saturation of quotas, accompanied by a net deficit in desirable immigration. The public thinks of the law in net terms. Within reasonable limits, it is easily capable of practical administration in such terms.

The whole problem of immigration involves the most delicate relations with foreign nations. To discriminate invidiously against their nationals by the arbitrary selection of this or that census of the past as a subterfuge will neither better our relations nor help

to increase the attachment of our foreign citizens to the country of their adoption.

The questions of policy and administration involved are great enough to deserve the attention of the three departments of the Government intimately related to the problems of immigration: the Departments of Agriculture, Commerce, and Labor. Each possesses special information and a representative relation to the great questions involved. While leaving the details of general administration and control to the Department of Labor, the secretaries of each of these departments might well constitute a board of final appeals in the serious questions involved in the final administration of our immigration policy.

Government becomes more difficult as life becomes more complex. But it still remains true that good government is obtainable under popular institutions only through the continuing interest of the citizen. Political indifference is still the besetting sin of business men. It seems true that the balance of political power is in the hands of the stay-at-homes.

Mr. Harding was elected President by an unprecedented majority, but only 49 per cent of the qualified voters of the United States went to the polls. Every conspicuous radical received a minority of the registered vote of his State. North Dakota elected Senator Frazier by 35 per cent of its registered vote. Senator Howell received 32 per cent of Nebraska's; Senator Wheeler 30 per cent of Montana's; Senator Brookhart 29 per cent of Iowa's vote; Senator LaFollette 28 per cent of that of Wisconsin; Senator Dill 17 per cent of Washington's; Senator Ferris comes from Michigan with but 16 per cent of its registered vote.

This means, if it means anything, that those who want change go to the polls. The conservative stays at home. If the educated, the level-headed, the responsible and the industrious, were as zealous, as energetic and as unfailing in their political activities as the mischievous, the demagogic and the revolutionary, the deliberate and steady influence of the great body of American thought and character would express itself at the polls. To remedy conditions like these, we need

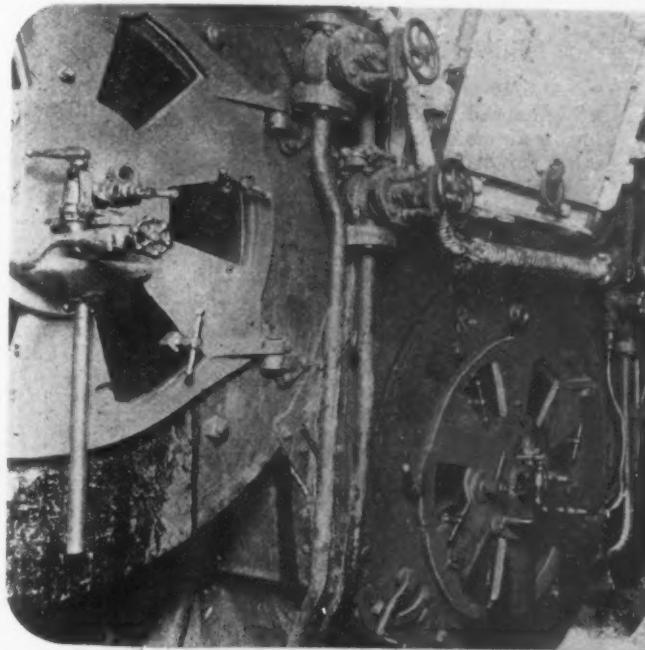
again the bugle call of George William Curtis. He pointed out that good men sit at home cultivating a feeling that somehow things will right themselves without effort on their part, or a feeling that politics is tiresome and dirty. The result, he said, will be "not a government mastered by ignorance, but a government betrayed by intelligence." Such things may happen, he said, not because "bad men are brave, but because good men are infidels and cowards."

Fuel Oil Burning System

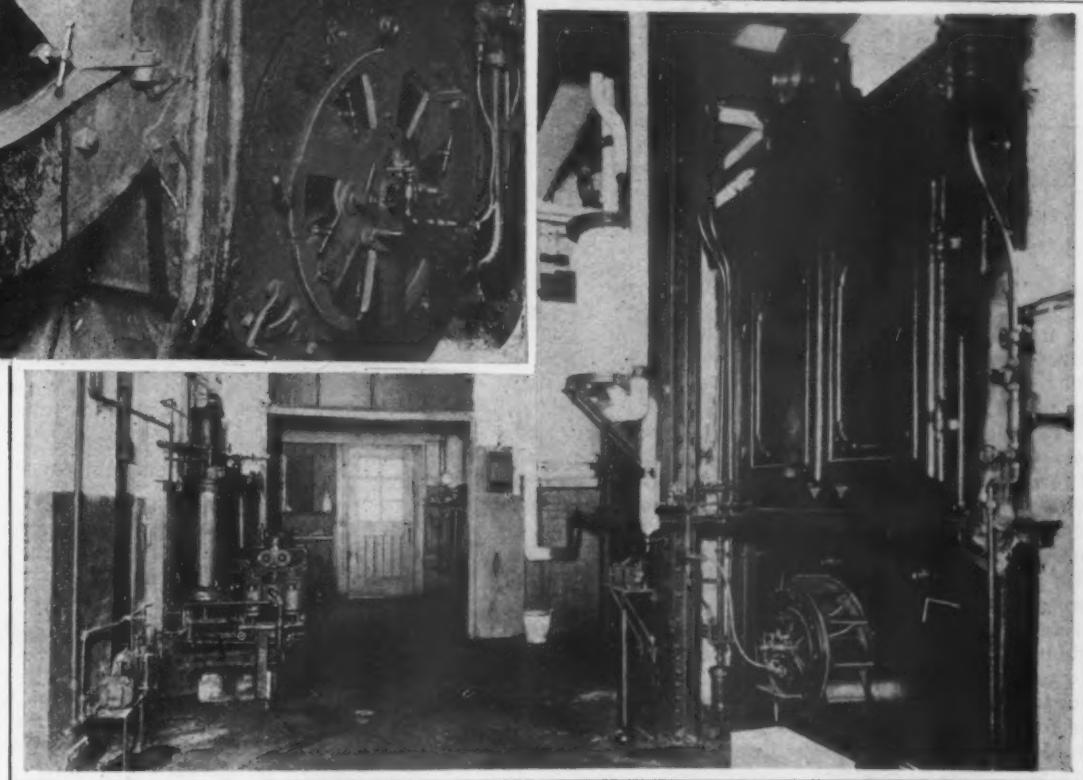
Both natural and forced draft are covered in the two principal variations of the fuel-oil burning system of the Morse Dry Dock & Repair Co., New York, which has long been devoted to marine work and is now being extended to industrial practice. Designed primarily

to meet conditions and can be locked in any position desired. A peep hole permits the operator to see just what the flame is doing at any time.

Under the control thus made possible, flames may be produced as short as 3 ft. and as long as 20 ft. or more. They can be adjusted so that any desired surface within range may be bathed in the heat or they



At Left Are Two Units of a Forced Draft System; Below Is a Natural Draft System. In both cases the auxiliary air supply for governing the shape of spray cone enters through the orifices surrounding the central pipe carrying oil to the burner nozzle



for boiler furnaces, the system is being developed for other types of heating requirements.

One illustration shows a natural draft outfit installed in a stationary boiler. The vanes in the air register are under close control, these furnishing air for combustion. Additional air used in controlling the angularity of the conical spray of oil enters around the center and is directed through appropriately shaped passages. In the meantime the oil under pump pressure (or with steam atomizing, as desired) is forced through the orifice of the nozzle in the form of a fine spray.

In the other illustration a forced draft system is shown, the air from the blowers entering through the outside ring. Additional air through the openings shown around the burner is used for forming the cone as before. In both cases the openings can be controlled

can be made to clear the surface and subject it only to radiant heat. Either a reducing or an oxidizing flame may be produced to suit conditions.

The annual banquet of the Engineers' Society of Western Pennsylvania will be held Monday evening, Jan. 28, at the William Penn Hotel, Pittsburgh. Elisha Lee, vice-president Pennsylvania Railroad, and F. I. Kent, vice-president Bankers Trust Co., New York, will be the speakers. Strickland W. Gilliland, humorist, also is scheduled. A. W. Thompson, president Philadelphia Co., will be toastmaster.

Carnegie Steel Co. has awarded a contract to Wal-lis & Carley Co., Sharon, Pa., for the building of 50 dwelling houses in Clairton, Pa.

Lift Truck for Heavy Dies and Castings

The heavy-duty lift truck illustrated, designated as the Hi-Lo Tractor, has been added to the line of the Elwell-Parker Electric Co., Cleveland. As the name tractor is now commonly applied to gas propelled machines, the company has adopted the designation tractor to distinguish electric trucks and tractors from the former.

The new machine, rated to handle 6000 lb. loads, is intended for service in handling heavy dies in forge shops and large castings in foundries, over rough floors.



Lift Truck For Loads up to 6000 Lb. The elevator platform is designed to take loads close to the floor. The hoisting speed is 5 to 6 ft. per min. and the travel 300 to 400 ft. per min.

The truck will take a load at any height up to 6 ft. and deposit it on the floor or at any level up to 6 ft. above the floor. It is 112 in. long, 95 in. high and can be driven through a 3-ft. 6-in. doorway. The travel is 300 to 400 ft. per min. and hoisting speed 5 to 6 ft. per min.

The elevator platform is designed to take loads close to the floor. The load deck is a cantilever built of formed plate sections on two steel arms. Each of the two arms at its supporting end carries two large rollers fitted with double row ball bearings. The lower or forward rollers just beneath the platform are provided with deep flanges and travel on machined ways on the face of heavy channel uprights. The upper rollers are straight faced and bear on machined ways on the rear side of the channel. The two platform arms also carry the moving portion of the hoist mechanism which counterbalances a portion of the platform weight. The platform is hoisted by an inclosed motor connected to a double grooved hoist drum forming a self-contained unit just above the battery compartment.

Two cables run over sheaves at the top of the elevator uprights, thence to two grooved drums carried on the elevator head parallel to the main hoist drum. These cables drive the drums which in turn drive two pinions one on either end of the drum support shaft. When the two single cables are wound in on the main drum the secondary drums revolve and the pinions travel up the racks on the elevator columns carrying the elevator head and platform. Each of the two cables carries less than 25 per cent of the load. It is stated that the design assures a level platform regardless of load distribution. A safety switch automatically limits travel of the platform. When descending the loaded platform drives the hoist motor as a generator and returns some of the power drawn from the battery when raising.

Heavy steel castings with wide flanges join the two axles. The elevator ways are riveted to these as well

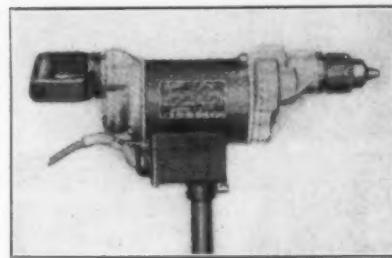
as to the structural frame above the driving axle. The three-point supported power unit plant consists of a motor directly connected to the worm gear or bevel differential. A service brake drum with a flexible joint inside is located between the motor and differential. Alloy steel drive shafts spline into the differential and each drive shaft is fitted with a chrome vanadium ball universal joint to permit steering simultaneously with driving. The knuckle pin carries a $\frac{3}{4}$ -in. ball at top to provide easy turning. Each yoke between the differential case and knuckle is machined with saddles for dual coil springs.

The front axle is a steel casting bored and fitted with a steel axle which carries on knuckle pins two cupped wheels with two sets of long tapered roller bearings in a dust-proof case and dual 10 x 3-in. solid rubber tires. These tires will differentiate when the wheel is steered. This provides easy steering for the greater part of the load is carried on this axle. The platform has a patented tapered nose and is in plain view when in its lowest position.

Side-Handle Portable Electric Drill

A 5/16-in. capacity side-handle drill in two types, a high-speed machine for use in wood and metal drilling in automobile body work and car building, and the other for drilling in hard metals where a slower speed is preferred, has been placed on the market by the Hisey-Wolf Machine Co., Cincinnati.

The machine is equipped with the company's universal electric motor for operation on alternating current, 60 cycles or less, and direct current of the same voltage. Ball bearings are used throughout. A new feature is the quick cable connector permitting of cable repairs and renewals without dismantling of the machine. The switch is conveniently located in the side grip handle. Gears are of steel, machined and heat treated, and gears, bearings and other moving parts in the gear end of the machine are lubricated from the gear transmission case. The ball bearing on the top



A New Feature Is the Quick Cable Connector Permitting of Cable Repairs and Renewals Without Dismantling the Machine

head is packed with grease. Regular equipment includes 15 ft. of cable with attaching plug and a Jacobs drill chuck. The net weight is 12 lb.

Fellowship in Metallurgy Offered

According to an announcement from Carnegie Institute of Technology in Pittsburgh, a fellowship in metallurgy has just been established by the Department of Metallurgical and Mining Engineering, and an appointment is to be made immediately. The fellowship will be under the general supervision of the Advisory Board of the Department of Metallurgical and Mining Engineering. The first problem to be studied under the fellowship is "an investigation of the effects of small percentages of phosphorus on the physical properties of low carbon steel especially under alternating stresses and shock." In his investigations, says the announcement, the appointee will be given the full cooperation of the members of the Advisory Board, which was recently organized and includes a prominent group of Pittsburgh district engineers and industrial executives.

The fellowship pays \$750 for the ten months of the college year. As an appointment will be made promptly for the remainder of the college year, applications are now being solicited. Candidates are requested to address W. E. Mott, director College of Engineering, Carnegie Institute of Technology.

Structures of Gray Iron and Semi-Steel*

Graphite Structures and Distribution—Control by Cooling and Composition—Silicon Adjustment

BY J. W. BOLTON

FOR the sake of simplicity in illustration, we can consider gray irons (including of course all semi-steels) as consisting of a metallic matrix filled with many small graphite flakes. We can separate it into these two parts. We can dissolve all the "iron" matrix with acids and have left the flakes of graphite carbon. If a piece of iron is cut plane, then carefully polished, careful visual examination will show small black flakes which are seen even better under the microscope or a

*Concluded from *THE IRON AGE*, Jan. 3, 1924. The author is metallurgist in charge of research, Niles Tool Works Co., Niles-Bement-Pond Co., Hamilton, Ohio.

strong hand glass. The presence of these small flakes (or the places out of which they have fallen) give to ordinary finished gray iron its grain appearance. Or we can take finely ground up gray iron, shake it up with a heavy liquid like chloroform (which has no action on the iron), pour the liquid portion off, and, on evaporation of the liquid mixture, the black residue is largely graphitic carbon. It is soft and acts like foundry blacking (graphite) when rubbed between the fingers.†

Properties of the Matrix

Let us consider the properties of the matrix first. Practically all the strength is in the matrix itself, as the graphite flakes are weakeners. The two major

†Such simple experiments, which can be performed in the ordinary foundry office, might interest the shop man and help show that metallurgy is no abstract complex subject, but a relatively simple one with many concrete applications.

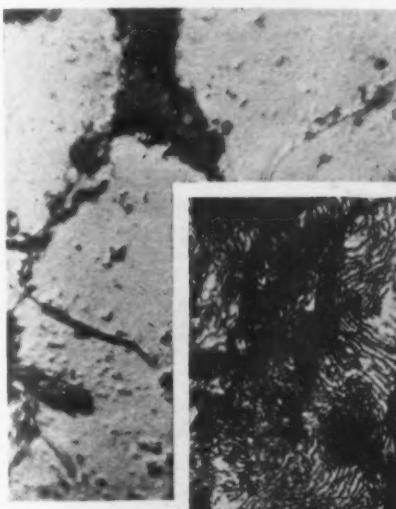


Fig. 12 (Left)



Fig. 13 (Right)

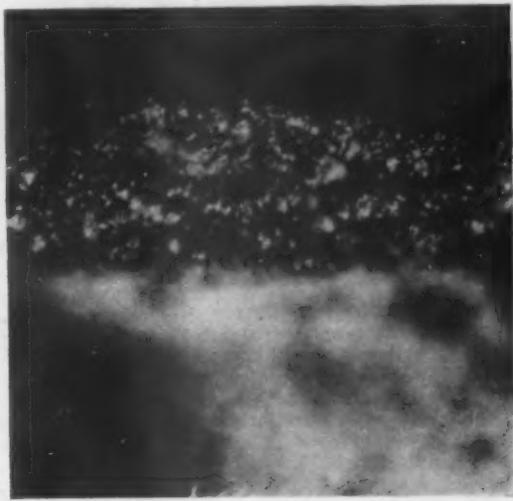


Fig. 14

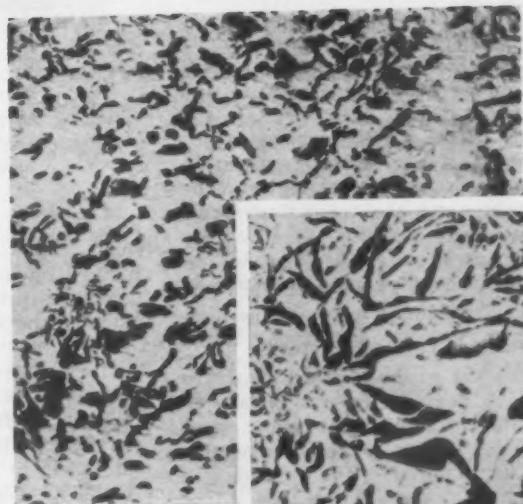


Fig. 15 (Left)



Fig. 16 (Right)

Fig. 12—The large polygonal grain is composed of ferrite (structurally pure iron). Magnification 725 dia., etched in picric acid.

Fig. 13—The "thumb print" structure is characteristic of pearlite. (Pearlite is the eutectoid of ferrite and cementite.) Pearlite is a promoter of strength. Transverse 4700 lb. Silicon 1.48, total carbon 3.28 per cent. Picture taken from center of A.S.T.M. bar. Magnification 600 dia., etched in picric acid.

Fig. 14—(Our C. I. 14) Graphite flake under high magnification. As this picture shows, the flakes of graphite consist not only of graphitic carbon, but have a network of ferrite and often contain gases and particles of sulphides. Magnification 700 dia.

Fig. 15—This high-test iron contains its graphite in small flakes. (A.S.T.M. bar, transverse 5100 lb.) Compare with Fig. 16. Magnification 100 dia., sample unetched.

Fig. 16—Large graphite flakes in weak test bar. (A.S.T.M. bar, transverse 2800 lb.) It should be compared with Fig. 15. Magnification 100 dia., sample unetched.

components of the matrix are ferrite and pearlite. (See Figs. 3, 12 and 13. The component ferrite is similar in many of its structural and physical properties to carbonless iron. (Armco iron, wrought iron, very low carbon steel.) Pearlite is similar in structure and physical properties to annealed 0.90 per cent carbon steel. It is evident that the matrix of greatest strength is wholly pearlitic. If the matrix is all ferrite, the combined carbon is nil. With increase of combined carbon, ferrite decreases and pearlite increases. Around 0.80 to 0.90 per cent combined carbon the matrix is wholly pearlitic. This accords with the fact that nearly all high strength irons are 0.60 to 0.90 per cent combined carbon. Above 0.90 per cent combined carbon, free ferrite has disappeared, and a new component free cementite appears. Free cementite makes the iron hard, brittle and weak. Summing up, the strongest

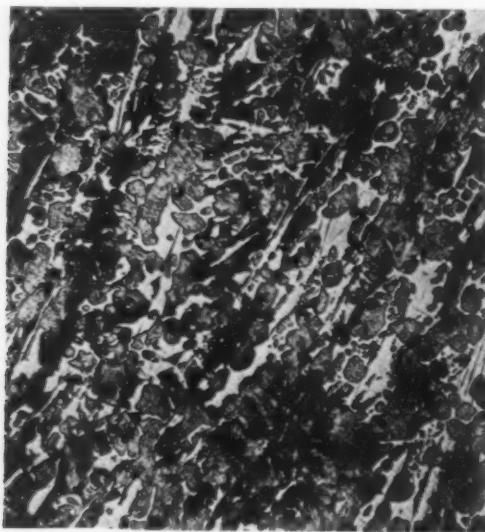


Fig. 17—(Above)—In Fig. 10 We Saw How a Gray Iron Appears When All Its Carbon Is in the Combined State. This, Fig. 17, shows the first step in the formation of the graphite flakes. This portion is partly chilled, and small black graphite nodules are seen beginning their separation from the cementite (or carbon rich) areas. Magnification is 75 diam. Sample was etched, then lightly re-polished

irons are those of a pearlitic matrix. The converse, a pearlitic matrix means a strong iron, is not necessarily true. (This matrix is often called the eutectoid matrix because pearlite is a laminar eutectoid of ferrite and cementite.)

The minor components of the matrix, such as steatite, manganese sulphide, etc., cannot be discussed in detail here. The writer also purposely neglects the effects of forms of pearlite and the transition forms between pearlite and austenite. While these various minor structural forms are of interest, they do not have the practical significance of pearlite, ferrite and free cementite.

Graphite Structure is Largest Factor

In commercial practice the graphite flake structure is of prime importance. A pearlitic matrix is easy to get in ordinary castings. An 0.90 per cent carbon steel will run over 100,000 lb. per sq. in. in tensile strength. A 40,000-lb. cast iron is not common. The difference is largely due to the graphite flakes. These pencil-like flakes have practically no strength (Fig. 14). Many 20,000-lb. cast irons have a pearlitic matrix. Study of the graphite flakes structure in commercial irons has not received proper emphasis, and the study of general grain size of gray iron is an almost untouched field. (We refer to macroscopic structure). Ordinary analysis is no sure indicator of physical properties.

Graphite flakes influence the structure and properties of the metal according to their amount, their size and their distribution. Everything else being equal, a greater amount or volume of graphite flakes means weaker metal. This fact is pretty generally recognized. Ordinary cast irons are about 12 per cent by volume graphite flakes (3.00 per cent graphite by weight). Commercial irons may be found as low as 9 per cent graphite by volume and as high as 15 per cent.

The size of graphite flakes is of even more importance than their amount. Large, coarse flakes break up the continuity of the matrix more effectually than smaller flakes. Figs. 15 and 16 illustrate this very clearly. Almost invariably a high-test iron has small flakes while a weak iron shows large flakes.

Graphite Distribution Not Sufficiently Studied

The distribution of graphite flakes has a marked effect on the engineering properties of gray iron. The question of distribution has received scant attention by gray iron workers. Researches of this laboratory show that the original distribution of graphite is determined by the previous distribution of cementitic car-

Fig. 18—Same Sample As Fig. 17, But Farther From the Edge. The graphite flakes, grown larger at the expense of the cementite, are gathering in whorls. Magnified 75 diam. etched and lightly re-polished

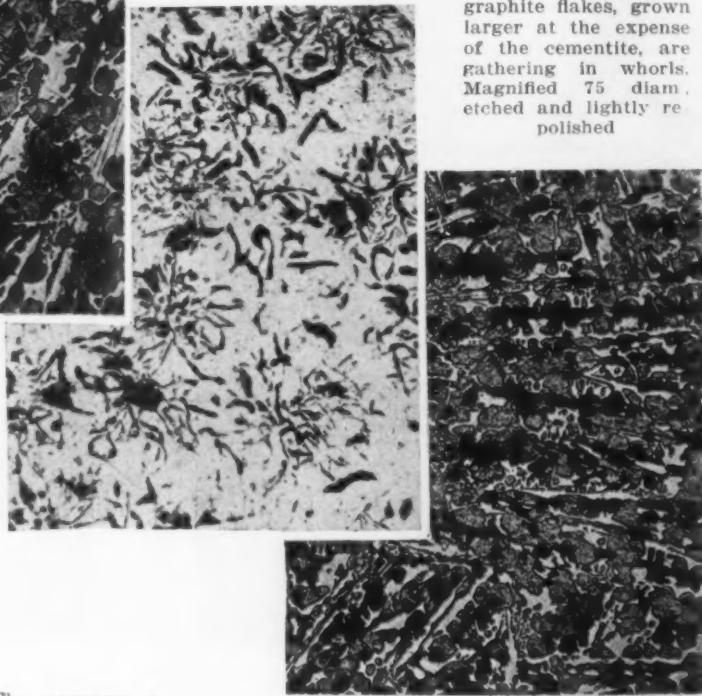


Fig. 19—Also From the Same Sample, But Unetched, and Taken Nearer the Center; Shows Practically Complete Graphitization of the Free Cementite. These whorls may later grow together to form large flakes like those of Fig. 16. Magnification 75 diam.

bons. (Figs. 17, 18, 19.) These distributions are changed by the phenomena of grain growth. The first formed or primary graphite, when evenly distributed, indicates the very highest test iron. To put it simply, a small amount of tiny graphite flakes, uniformly distributed, makes the best and strongest iron for any castings. See Figs. 15 and 16.

Macroscopic (low magnification) study of dendritic segregations in gray iron is a new field and promises to add much to our practical knowledge of gray iron's structure. (See Fig. 20.)

Control of Structure by Cooling and Composition

Control of the structure of gray iron is possible through adjustment of the cooling rate and of the composition. Cooling rates are determined in ordinary foundry practice largely by section size—heavy section, slow cooling, and vice versa. Efforts have been made



Fig. 20.—This Sample Was Polished and the Photomicrograph Is at 75 Dia. The black flakes are graphite. Note the unusual arrangement, just as though an invisible line were drawn through the sample. Such arrangements or distributions of graphite flakes must necessarily affect the physical properties. This iron, for example, was relatively stronger in tensile strength than in transverse. (Ratio 10 to 1 when ordinarily ratio is about 8 to 1.) The picture was taken at right angles to the axis of the bar. Such "lines" which radiate from the outside to the center are due to the original dendrites of cementite forms formed on cooling. They are naturally more uniformly distributed in a round bar than in a square. This is one good reason for favoring a round bar for the international standard

by use of chills, special molds, etc., to control the rate independently of the size section. While finding some local applications, these methods are usually expensive, and do not do a thorough job. This is especially true of castings of 25,000-lb. and more, where heavy sections are often encountered.

Use and Control of Total Carbon

Practical control is more commonly and conveniently exerted by adjustment of composition. This is best effected by changes of total carbon and silicon. Silicon control has been practiced for many years. Most foun-

iron), but it is not well suited to heavy sections. Good strong irons, even for heavy sections, can be produced with carbons 3.10 to 3.50 per cent. With carbon 3 per cent or under, the metal is often liable to segregation and, too, this low carbon is sometimes an evidence of improper cupola management. Careful operation will enable lower carbon irons to be used successfully in heavy sections.

Effect of High Coke Beds

High bed or heavy coke ratios tend to cause higher carbons. Some cokes, especially the slow melting kind, cause higher carbons. The carbon in the pig iron and the condition of the slag also affect the carbon in the mixture. Steel, fast melting and low tuyeres all tend to lower the carbon. (Although they do not necessarily always do it because overbalanced by other factors.) In the writer's consulting experience he has seen cupola irons running from 2.44 per cent to over 4 per cent total carbon. An iron under 2.90 per cent is rare. The majority of authentic high-test irons will run 3.00 to 3.40 per cent total carbon.

Adjustment of Silicon

Silicon must be adjusted to the carbon and the size section. In medium sections the writer has found that strength is inversely proportional to the ratio $Si + 2C$. (Fig. 21.) This does not hold on each and every bar, but an average of a large number of bars, cast and tested under the same conditions, will show that the relation holds. Silicones can be run as low as 0.60 per cent in heavy sections. The writer has seen a large casting (machined all over) of 1 in. section metal, 60 in. in diameter, and 15 ft. long cast and machined successfully with 0.90 per cent silicon and 0.35 per cent phosphorus. If the line of castings is uniform and the designs call for uniform section, a very nice balance between silicon and carbon can be maintained.

Once in a while we meet the foundryman who controls his silicon within a range of 0.03 per cent, plus or minus, the year around, and uses 50 per cent scrap. Well, strange things will happen, but control (with commercial scrap up to 60 per cent) within 10 points, plus or minus, is good enough. The average silicon analysis is off about 0.05 per cent anyhow. In this "accuracy business," as in the rest of life, the golden mean is better than either extreme.

Conclusions

Study of the detailed relations between the structure and the elements is a long, though worth-while, job. The structure controls the properties of the metal. The writer has shown in a general way what structures are desirable and what are undesirable. He also emphasizes that microscopic examination is one of the simplest and most exact means we have of determining the properties of a finished casting or for getting a line on metal problems. Practical means of control of structure have been briefly and non-technically explained.

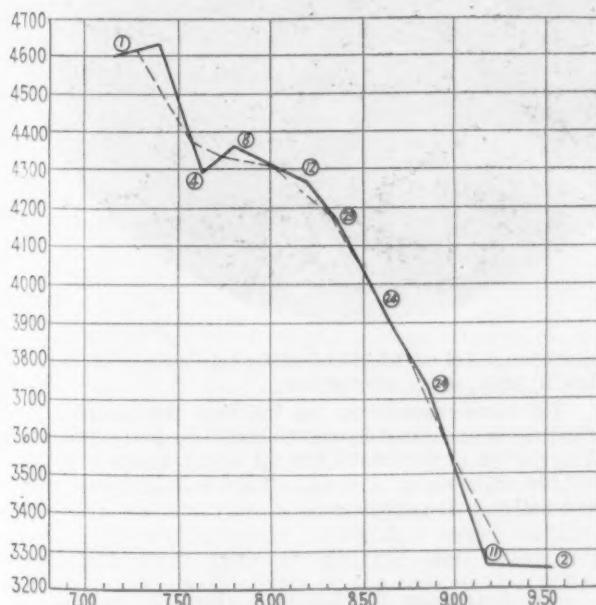


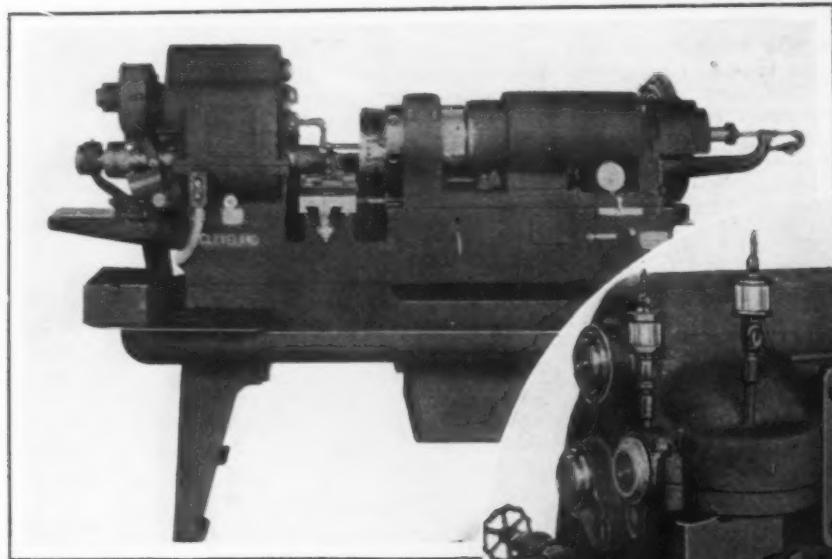
Fig. 21.—Average of 116 Bars, i.e. All $Si + 2C$; Averaged Between 8.50 and 9.00 Gives a Figure 8.85 ($Si + 2C$) and 3730 Lb. per Sq. In. Transverse Strength. The figures in circles are the number of bars for each point. The dotted line is a weighted average between points to get perhaps a more accurate and representative curve. Five mixtures of various steel contents represented

drymen could use lower silicon successfully, especially if they would use lower phosphorus. Control through total carbon is being given more recognition during the last few years. These two "elements" influence both the graphite and the matrix structures. The production of the highest grade irons is possible only through a proper balance of both of them. Very high carbon (around 4 per cent) causes a tendency to internal chills in small sections, and is susceptible to excessive grain growth in heavy sections. Somewhat lower carbon (3.60 to 3.75 per cent) with proper silicon may prove strong and fine grained in small medium sections (i.e. up to 2 in.); (we refer here to "eutectic"

Three-Speed Head for Screw Machine

A three-speed spindle head recently brought out by the Cleveland Automatic Machine Co., Cleveland, for its line of automatic screw machines has several features regarded as marked improvements in spindle head design and provides a completely self-contained production unit for work on bar stock.

The drive is either a single pulley belt or a constant speed motor. The spindle speed changes are two forward and one reverse speed on one set of change gears.



The three speeds are controlled automatically by the operation of clutch levers shown in the insert illustration, operated by cams on drums on the camshaft. The levers engage or disengage the clutches which bring the various combinations of gearing into position to produce the desired speeds. The gears and bearings are lubricated by a splash system inside the gear box.

Four sets of change gears are provided for each machine and these give a forward speed range of 137 to 751 r.p.m. and reverse speed of 265 r.p.m. This range of speeds is said to cover all the speed requirements necessary for production work within the capacity of the machine. The change gears may be easily placed in position. The feed mechanism is driven at a constant idle motion speed, regulated by the raising or lowering of the friction roll. The power to the feed is transmitted from the single belt pulley by a series of bevel gears and a driving shaft which is connected with the feed mechanism by a silent chain. The oil pump is also driven from this driving shaft.

The operation of the machine is simple. The starting and stopping is accomplished by means of a lever within easy reach of the operator, shown between the head and driving pulley. The motor is mounted on the leg at the rear, but if desired it may be mounted in an upper position and equipped with a silent chain drive. The front view of the machine illustrates its compact arrangement. There is no overhanging mechanism and all overhead construction is eliminated.

Last Year Made a Record for Construction

The Copper and Brass Research Association's annual survey of building construction places the total expenditure during 1923 at \$5,922,900,000, the largest single year in the history of the building industry, bringing the total volume of construction for the past two years to \$11,000,000,000, which is somewhat higher than some other estimates.

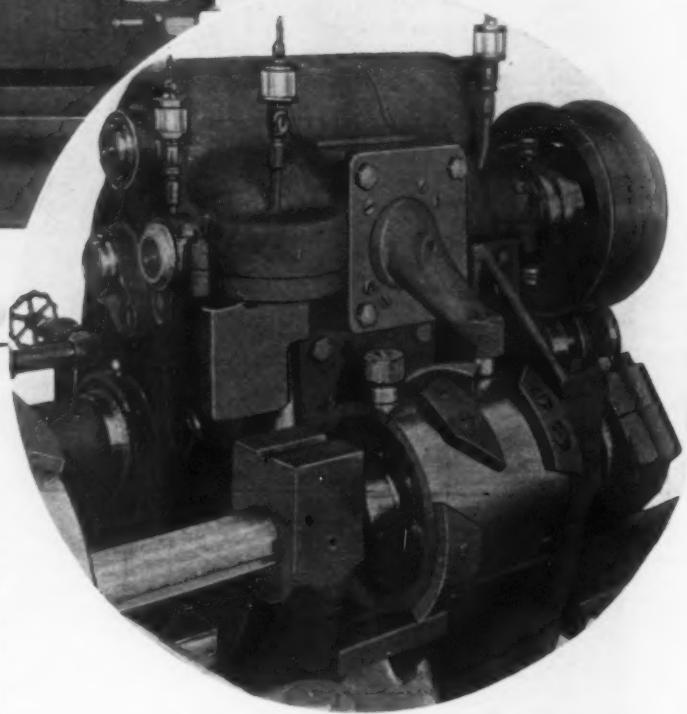
During 1923 the expenditure for residential buildings, including dwellings, apartments and hotels, amounted to \$2,302,240,000, so that nearly 40 per cent of the total expenditure went to relieve the acute

housing shortage which still existed at the beginning of the year.

July 1, 1921, saw an estimated building shortage of \$8,084,985,000, and construction during the remainder of that year reduced this figure to \$6,363,835,000 on Jan. 1, 1922. Construction in 1922 reached the total of \$4,910,000,000, of which \$3,125,000,000 represented the normal yearly demand for new construction, so that the shortage was relieved during 1922 by \$1,785,000,000.

Total construction of \$5,922,900,000 during 1923 has contributed further to relieve this building short-

Automatic Equipped With Three-Speed Spindle Head. The machine may be driven by a single-pulley belt or constant-speed motor. Two forward and one reverse spindle speeds are obtained with one set of change gears. A view of the head is shown below



age by a total of \$2,617,900,000, leaving a shortage on Jan. 1, 1924, of \$1,960,935,000.

The total expenditure for building construction during 1924 is estimated by the Copper and Brass Research Association at \$4,835,935,000, of which amount \$3,125,000,000 represents the expenditure necessary for normal building requirements.

Rebuilding National Tube Co. Stack

The National Tube Co. has been granted an appropriation of \$1,500,000 by the United States Steel Corporation for improvements at McKeesport, Pa., the bulk of which will be used in rebuilding No. 1 blast furnace at that works. This furnace was built in 1907 and was the last of the four stacks at this plant to be completed and placed in operation. It was first operated Oct. 10, 1907, and was relined in 1918. Work of rebuilding will begin in a few months. No. 4 furnace, built in 1890 and first operated in 1891, was rebuilt in 1919. No. 3 furnace, built a year before No. 4, was rebuilt in 1908. No. 2 furnace stands as completed in 1905.

"Health Service for Small Plants" is the title of a safe practices pamphlet just issued from National Safety Council headquarters, Chicago. The health activities outlined in this pamphlet have been found practicable for plants employing 400 or 500 men or more and many of the methods can be adopted in plants employing as few as 50 men.

Manufacturing Seamless Steel Tubing—II

Rolling the Pierced Billet to Proper Wall Thickness and Reducing to Finish Size—Operation of Reeler or Expanding Mill

BY E. R. KELSO*

THE next operation brings the pierced billet to the rolling mill, the main function of which is to reduce the wall thickness and, of course, lengthen the tube. There are two distinct types of rolling mills in use, which are called automatic mills and hand mills. The former will be described in full later. The hand mill differs from it only in the manner of handling the tubes. To understand the difference in these mills it is necessary to go briefly into the uses to which they are put.

The automatic mill is designed as part of a full hot mill unit, with reelers and reducing mill to follow. It is best suited to quantity production of low and medium carbon content tubes, such as pipes, boiler flue and some mechanical tubing. The mill must be set up for different sizes of tubes and a change to another

ing toward a quantity production of pipe, boiler flues and the cheaper mechanical tubing will have a preponderance of automatic mills, but should have one or more hand mills to take care of the inevitable small orders and cobbles. If the high quality mechanical business is sought without so much regard to tonnage, the hand mill will be used extensively; but an automatic mill, probably, and the machines which follow it, the reelers and reducing mill, surely could be used to advantage to round out the equipment and make quantity production of quality tubes whenever the nature of the order might permit.

The mill is a conventional two-high rolling mill with several oval grooves of different sizes in the rolls, an inlet trough and ram adjustable sideways to meet any groove, and a mandrel on the back side holding a plug

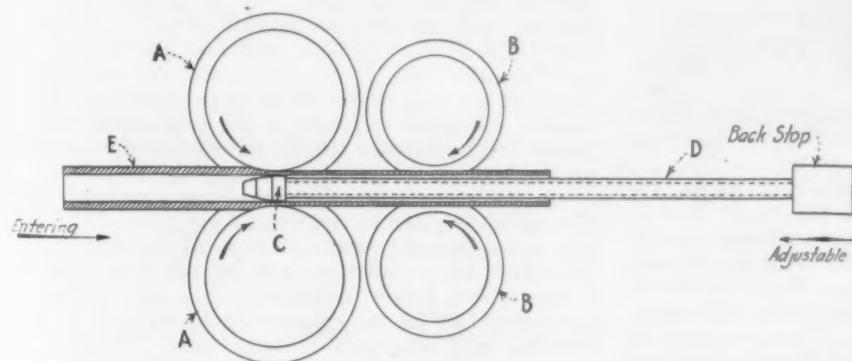


Fig. 2 Is a Side Elevation of the Rolling Operation, With the Tube Cut in Section Along Its Axis

size causes delay. It would be impracticable to make several of these changes in one day, for small orders. The tube is passed only two or three times through this mill, and through the same groove always. The characteristics of the automatic mill are, then, a high rate of production with low labor costs.

Hand mills need not be set up for different sizes, any groove being available at a moment's notice. The rolls are usually longer and with a larger number of different sized grooves than the other mill. There is more manual handling of the tube in this mill; instead of the stripper rolls described later with the automatic mill, the tube is passed back by hand, the operator first withdrawing the mandrel and placing it opposite any groove desired. The reduction in cross section area of the tube will be less on this mill and the operation slower. This mill is not adapted to quantity production, but is very well suited to running small orders, high-carbon and alloy steels which require careful handling and light reductions, a wide range of high quality mechanical tubing and to working up "cobbles" made on the other mill. These cobbles are any tube which has stuck in the mill or for any reason not received the full process. With the best of practice they will amount to considerable tonnage, and the hand mill is best suited to reworking them.

Conditions Determine Mill Type

The nature of the business sought by the producer will determine the type of rolling mills. Those aim-

in position, as shown in Fig. 2. The plug holds up or supports the inside of the tube while the rolls are squeezing it down to the desired wall thickness and outside diameter. In addition, on an automatic mill will be found stripper rolls running in opposite direction to the main rolls, which strip the tube from the mandrel and pass it back between the main rolls and out into the inlet trough again.

Rolling the Pierced Billet

In rolling, the pierced billet *E* is rammed up into the main rolls *A* and *A* with sufficient force to make them take hold. The tube passes completely through until its rear end lies between the two sets of rolls. Meanwhile the rolls *A*-*A* are held at such center to center distance that they will do the desired work on the wall of the tube, and the stripper rolls *B*-*B* are separated so that they do not touch the tube. Now when the tube is clear past the main rolls they are rapidly spread and the rolls *B*-*B* are brought together to bear on the tube and roll it back out to its original position. The groove is oval shaped in profile and there must be some clearance between the rolls.

With the pressure as applied it is natural to expect a rib to form, as shown in Fig. 3; indeed, this is what happens more or less in all rolling operations. The amount of rib depends on the amount of excess metal in the tube and on the pressure applied. If the tube has been pierced with too heavy a wall, or if the reduction is too great in the rolling, this "overfill" will produce a well defined projection between the rolls called a "rib," which, if too pronounced, can never be remedied because, on the following operation, it

*Formerly with National Tube Co., later chief engineer Weldless Tube Co., Wooster, Ohio, now with Mackintosh-Hemphill Co., Pittsburgh. The first portion of this article appeared at page 57, Jan. 8.

will simply bend over and be rolled in without welding and show up later as cracks.

After the first operation above described, the tube is turned about 90 deg. on its axis so as to locate this rib in the vertical plane, when the tube is passed through the rolls again and back out. This is repeated as many times as necessary to get the desired reduction or to work in the overfill. Two passes will suffice for most of the automatic rolling mill work. On a hand mill, where the reduction per pass is less, the tube will be given several passes, as the high-carbon and alloy steel will not stand the hard work incident to the comparatively heavy reductions in an automatic mill. Also, they have to be worked in a narrower range of temperature than ordinary steels and consequently have to be reheated oftener.

Another distinction between the two types of mills is the fact that, whereas the automatic mill is complete in one stand of rolls, the hand mill will have a "breakdown" stand, followed by two or three finishing stands of rolls with reheating furnaces between.

Unless the hand mill is followed by reelers and reducing mill, its product goes directly to the cold draw department. About 2 1/4 in. diameter is the smallest that can be rolled on the breakdown stand and 1 1/8 in. on the finishing stands, taking about eight passes in all. Any further reduction is done in the draw benches.

Work of the Rolling Mill

The rolling mill then reduces the wall thickness and elongates the tube. The reader will understand that the weight of the tube before and after rolling will be the same, if the loss from scale is neglected. So, if the pierced billet, as it enters the rolling mill, weighs say about 63 lb. and is 2 1/2 in. outside diameter and its wall is 1/4 in. thick, it will be 9 ft. long. Now if we roll this tube down to 1 1/8 in. wall by 2 1/8 in. outside diameter, its length after rolling can be readily calculated to be 19 ft.

In fact, it is the length mostly that guides the roller. It is much easier to watch the length than to caliper the wall of a hot tube. The work order shows the length expected at the rolling mill and, with the proper size plug and groove in use, the tube will be very nearly the right wall if rolled out to the calculated length. Some mills have a mirror set at such an angle that the roller can see behind the mill just how long the tube is being rolled. The top roll is adjusted up and down by means of screws actuated by a large hand wheel, screwing down to bring the rolls closer together; thus the wall thickness and length can be controlled as desired.

Main rolls are cast iron of special roll mix and may vary from 14 to 24 in. or larger and the rolling speed will be about 625 ft. per min. and the stripper speed about 850 ft. per min. The plugs are changed after each pass, spares being kept in a water-filled box handy to the plugger. They are castings of various mixes. A good rolling mill plug is an essential to the production of good tubing of any class and an absolute necessity for hot finish product. The surface of the plug is subjected to exceptionally hard service.

If it does not wear away evenly, but becomes rough, it will leave deep scratches in the inside surface of the tube. As all the movement in the rolling mill is longitudinal, without any spinning, it can be seen that any projection on the surface of the plug will make a corresponding scratch the full length of the tube. If these are too deep, they can never be removed in later operations. The mandrel is kept as large as possible and is water cooled. It has to be a little smaller than the plug which governs the inside diameter of the rolled tube.

Size of Tube Vital

The tube must be the proper size from the piercing mill or it will not enter the rolling mill, the ram trying in vain to force it between the rolls at the start. When this happens, the tube can only be laid aside and later reworked. In a well designed mill, the automatic rolling mill will just take the product of the piercing mill with everything running smoothly.

It is customary to see from one to four tubes on the skids between the piercer and rolling mill. The crew on one or the other mill will have different luck for a few minutes and the number of tubes will vary. Of course, the steel cannot be allowed to cool perceptibly, but the piercer crew will keep right on if the rolling mill crew has a slight delay and usually the rolling mill men will fight their way back even. Of course, if anything serious happens to any operation following any of the units, all must close down until the trouble is located and fixed.

Automatic rolling mill policy is to keep tubes large and reduce the outside diameter later, for tonnage reasons. Small mandrels give lots of trouble. About 2 1/2 in. groove is the smallest practicable for good tonnage production and larger sizes roll better. Of course, this is only for small sized tubes. When producing larger ones they will be rolled at very near the finished size. Number 12 gage or 0.109 in. is about the thinnest wall that can be rolled. Following the rolling mill are two reelers or expanding mills. One reeler cannot keep up with a rolling mill except in mills rolling very large tubes.

Reeler or Expanding Mill

In principle and appearance the reeler resembles a piercing mill very closely. It is a cross rolling mill with inclined rolls similar to the piercer rolls, except that they are not so tapered, being cylindrical for several inches in the center. They are cast iron of special roll mix. Guides, mandrel rod and plug or point also bear a close resemblance to their counterpart in the piercing mill. The plug, while pointed, has the same diameter for several inches at its biggest part. The reason for this and also the longer "flat part" on the rolls is apparent when we consider the object of the mill, which is to do further work on the outside and inside surfaces of the tube, removing any rib or light scratches left in the rolling mill, evening up the wall thickness and rounding up.

In ordinary reeler practice, comparatively little change takes place in the weight per foot of the tube. The squeezing and rotating action of the rolls on the tube wall, supported internally by the plug, produces a tube a little larger in diameter than when it entered the reeler. At the same time the tube actually shortens and the wall thickness remains nearly constant. It is possible to reduce the wall of say 3/16 in. wall tube by about 1/64 in., but it might be said for all practical purposes that the wall remains the same. The bearings of the rolls are movable in and out in respect to the pass center line and one of them is so moved by the operator who, keeping an eye on an ammeter, can keep the pressure constant throughout the length of the tube. The closer the rolls are together, the larger the diameter of the resulting tube, within certain limits. The diameter will increase about 1/8 in. in ordinary practice.

Man-Economy of the Reeler

The fact that the reeler will roll out the rib referred to under rolling mill, provided it does not project too far, that it will smooth up the surface and round up the tube, is very important when it is considered that one pass through the reeler with only two operators will accomplish what would take several extra passes through the rolling mill, and that no amount of work on the rolling mill would produce so round and smooth a tube. This machine is an essential to the production of good hot finished tube and produces better tube ready for cold drawing, with resultant saving.

Several minutes will have elapsed from the time the billet is drawn from the piercing mill furnace until it is reeled, and it must be remembered that we are working with light wall steel compared to ordinary rolling mill product. But one more operation remains in the manufacture of hot finished tubing, namely, reducing to the diameter ordered. While there are a few exceptions, it can safely be stated that a reheating is now necessary before reducing. The exceptions are on heavy wall tube, which will hold its heat longer, or on orders with very little reducing, which is simply sizing.

Other considerations however point toward at least a partial reheating as the best practice. For instance, on heavy wall tube with considerable reduction in diameter, the effect on the reducing mill and rolls is injurious. In fact a very much heavier mill would be necessary if the tubes were not reheated. The same consideration applies to sizing, particularly wear on the rolls. But still another most important factor is a metallurgical and not a mechanical one. Most orders, if not reheated, would have to be annealed after reducing, as this operation would then come under the head of cold working. The reheating then eliminates the necessity of annealing afterward.

Reheating Furnace

The reheating furnace is located somewhere between the outlet of the reelers and the reducing mill, usually up as close as possible to the reducer. It is a much smaller furnace than for the piercing mill—from 24 to 30 ft. long and 4 or 5 ft. wide inside. It is fired with several burners spaced along the sides, to give it a uniform temperature throughout its length, and the tubes will be pushed through it lengthwise and up to the first stand of the reducing mill. The process being continuous, from one to about eight tubes being in the furnace at once, depending on how cold they have become, it takes only from one minute to two or three, according to conditions, to reheat.

Reducing Mill

Next in line is the reducing mill, the object of which, as stated before, is to reduce the diameter of the tube as desired and size it. A reducing mill is simply several small rolling mills set as close as possible

There is no mandrel or point in the tube in this process, the reeler being the last operation which works on the inside of the tube. During reduction, the wall will thicken up, this thickening being allowed for in figuring out the wall thickness to work for at the rolling mill. Of course, while reducing, only part of the metal flows into wall thickness; the balance squeezes out or flows into increased length. This necessitates running the rolls of each successive stand at a greater r.p.m. than the preceding. This is accomplished by different ratios of bevel gears from the drive shaft to each stand, or four stands in sets may have the same r.p.m. and the rolls for each stand vary in pitch diameter.

A great number of rolls and housings are necessary for making all the different sizes and sufficient



One of the Two Sets of Reelers, With Its Motor and Gears

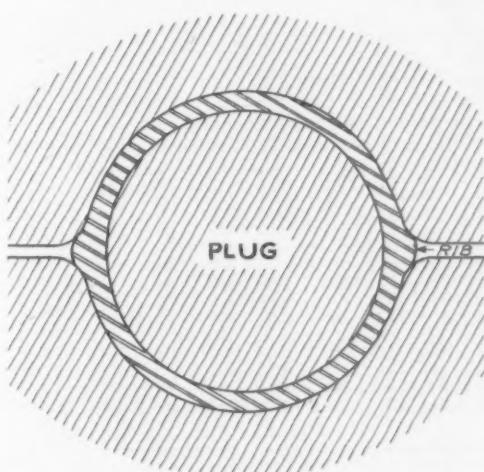


Fig. 3 Is a Cross Section Through the Rolling Groove, Showing Formation of a Rib on Two Opposite Sides of the Tube Being Rolled

together and each stand at right angles to the preceding one, all on the same pass line. The center lines of the rolls are all perpendicular to the pass line, as described for the rolling mill, but the first stand is tilted 45 deg. to the left of vertical, the second 45 deg. to the right, the third 45 deg. to the left, and so on. The mill may have from 8 to 16 stands, not all of which are always used. The rolls are chilled iron.

Given say a 3-in. tube to start with and 2-in. tube desired, the first stand would have a groove cut in the rolls about 3 1/2 in. high and oval, the width being greater than the height. Then the reduction would be split between the number of stands to be used, keeping as much of the reduction in the first few stands as possible, the groove in each one getting smaller and smaller until the pass before the finish is reached, which will be almost the same groove as the finish pass, leaving little work to be done in the finish pass, which will consequently wear longer without redressing. The finish pass will be from 8 to 18 thousandths of an inch bigger than the diameter desired, to allow for shrinkage in cooling. To get a uniform product it is necessary to reheat uniformly.

spares should be kept ready to use should a set break. The reader has, no doubt, seen for himself the reason for tilting the successive stands to the opposite 45 deg. He will recall that, in the rolling mill, the tube was rotated a quarter turn between passes to roll out the rib formed between the rolls. In the reducing mill the tube goes straight through, so the stands are tilted to bring the overfill, or at least the greatest width of the oval, from the preceding pass to the smooth bottom of the groove in the next one, which is also the least dimension of this groove.

Economics of Reducing Mill

That the reducing mill effects a great saving in the cost of producing tubes, especially in the smaller sizes, is apparent when it is remembered that 2% in. diameter is about the limit of reduction on the rolling mill, whereas the reducing mill gets down to 1% or 1 1/2 in. diameter. Furthermore, it allows the rolling size to be left as large as good rolling practice demands. It saves extra passes through both the rolling mill preceding it and in the draw bench afterward, beside producing a smoother, more nearly round and straight tube. The further operations of cooling, straightening, cutting off the rough ends and testing are common to all tube mills, whether seamless or welded.

Work Order as Guide

The work order gives the dimension of the tube in the different stages from billet to finished tube and also the diameters of bars and points. The billet weight will never be the same as the weight of the finished tube. Loss of steel from scaling and rough ends has to be added for hot finished tubes and, if cold drawn, allowance also has to be made for the point and loss in annealing and pickling. Besides the above, which adds to the weight of each billet, the number of billets must be increased above the number of tubes desired, to allow for the cobbles which cannot be reworked and are scrapped. If there is less

scrap than expected, the overage can always be used on some other order.

Typical Work Order

Tubes required, 2500 pcs., 2 in. x 11 gage hot rolled boiler flues, 20 ft. long.
 Billets required, 2750 pcs., 2 $\frac{1}{4}$ in. dia. x 32 in. long x 54 lb.
 Total wt. 148,500 lb.
 Pierce O. D., 2 $\frac{1}{4}$ in., wall 7/32 in., length 8 ft. 6 in., bar 2 $\frac{1}{2}$ in., point 2 $\frac{1}{4}$ in.
 Roll O. D., 2 $\frac{1}{4}$ in., wall 7/64 in., length 18 ft. 0 in., bar 2 $\frac{1}{2}$ in., point 2 $\frac{1}{4}$ in.
 Reel O. D., 2 $\frac{1}{4}$ in., wall 7/64 in., length 17 ft. 6 in., bar 2 $\frac{1}{2}$ in., point 2 $\frac{1}{4}$ in.
 Reduce O. D., 2 in., wall 11 gage, length 21 ft. 6 in., number of stands, 10.

The reducing mill above described is the last step in the manufacture of hot finish seamless tubing, no further work being done on the diameter or surface of the tube except the polishing incident to straightening. The usual hot finish specifications allow 0.020 in. total variation from the diameter ordered, as 0.010 in. over or under or 0.020 in. over and nothing under. Hot finish product cannot be held closer than this and it is a constant fight at the reducing mill to keep the tube that close. Customers would do well to give all the allowance possible, making their business more attractive. The surface of hot finished tubes will be about as smooth as ordinary gas pipe.

When the Tube Must Be Cold Drawn

If a smoother surface or closer limits of size or smaller tube is desired than can be produced in hot finish, then the tubes must be cold drawn. There is no practical limit to the smoothness and exactness possible in the cold drawn department. Here again the customer is wise who does not demand more than he really needs as to finish. It would be good practice for customers always to inform the mill of the purpose for which the tube is to be used. Some customers order hot finish when they really need cold drawn, and are therefore disappointed and blame the mill for furnishing tubes too rough, or not close enough to the size wanted.

On the other hand, many users are ordering cold drawn tubes when the cheaper hot finish would satisfy their requirements. An instance occurred where one concern specified large tonnage of cold drawn tubes for a part the nature of which would allow considerable roughness and variation in size on the inside and the outside of which is machined at all important points. There would also seem to be an excellent opportunity for the different automotive companies to standardize on sizes as well as finish. Several companies, for instance, making cars of about the same weight and price, use rear axle housings that vary by only $\frac{1}{8}$ in. in diameter, one from the other.

FUEL REQUIRED TO HEAT IRON

White Welding Heat Obtained in an Open Forge Fire Under Constant Air Blast

BY A. D. WILLIAMS

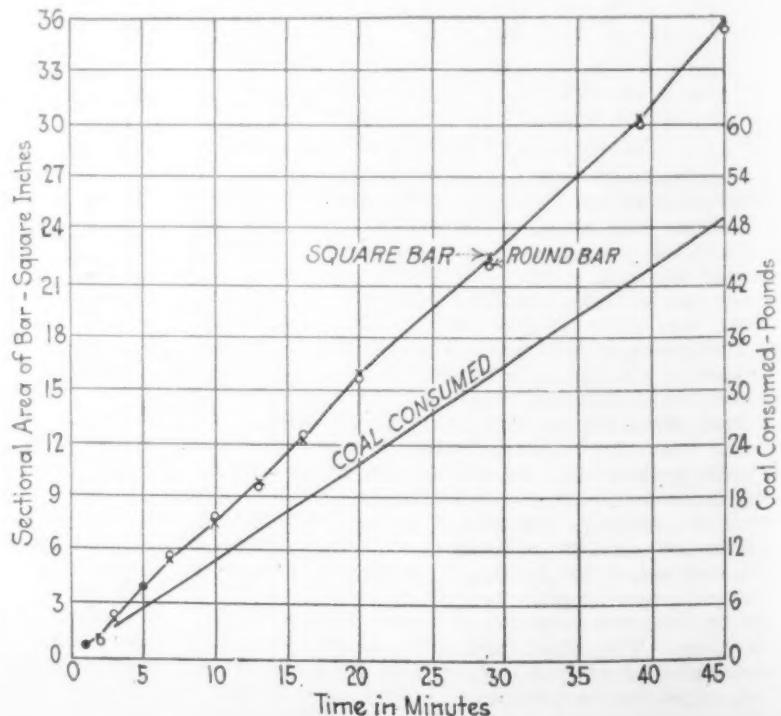
PRACTICAL tests made in the shop of la Compagnie Générale des Voitures à Paris by Fremont some time ago gave rise to constants based upon the quantity of coal consumed for heating iron to a white welding heat for a length of about 8 in. The study was made on square bars varying from 20 to 150 mm. on the side ($\frac{1}{4}$ in. to 6 in.) and on round bars of approximately the same sectional area. The time required was found to vary approximately in proportion to the sectional area, while the coal, being consumed uniformly, varied directly as the time, about 1.1 lb. per min. being used. The air blast for the forge averaged 70 cu. ft. per min. at a pressure of about 6 in. of water.

It was found that 1 cu. cm. of iron required 2 metric calories to bring it to a white welding heat. This represents 56 B.t.u. per cu. in. The heat covered in this way includes both the heat absorbed by the section under study, and that carried by conduction into the portion of the bar outside the fire.

Coal containing 4 per cent of white ash was used, the volatile matter being 28 per cent by weight. This coal, tested in a Thomson calorimeter, showed 8450 calories or 14,100 B.t.u. per lb.

Much depends upon the expertise of the worker and the quality of the coal used as to the consumption of coal under varying conditions. In one-half the time given under each heading, and consequently with one-half the coal consumption, the bars were heated to a cherry red.

Iron Heated to a White Welding Heat for a Length of 20 cm. (8 in.)							Time for Coal	Volume of Air	Heat Absorbed	
in. m/m	in. m/m	Round Heating	Consumed	Blown	Eng.	Metric	lish			
$\frac{1}{4}$	20	$\frac{1}{4}$	23	1	1.1	0.5	2	70	160	290
$\frac{1}{2}$	30	$\frac{1}{2}$	34	2	2.2	1.0	4	141	360	650
$\frac{1}{2}$	40	$\frac{1}{2}$	45	3	3.3	1.5	6	212	640	1,150
2	50	$2\frac{1}{4}$	57	5	5.5	2.5	10	350	1,000	1,800
$2\frac{1}{4}$	60	$2\frac{1}{2}$	68	7	7.7	3.5	14	495	1,440	2,600
$2\frac{1}{4}$	70	$3\frac{1}{2}$	80	10	11.0	5.0	20	705	1,960	3,500
$3\frac{1}{2}$	80	$3\frac{1}{2}$	90	13	14.3	6.5	26	920	2,560	4,600
$3\frac{1}{2}$	90	4	102	16	17.7	8.0	32	1,130	3,240	5,850
4	100	$4\frac{1}{2}$	113	20	22.0	10.0	40	1,410	4,000	7,200
$4\frac{1}{2}$	120	$5\frac{1}{2}$	135	29	32.0	14.5	58	2,050	5,760	10,400
$5\frac{1}{2}$	140	$6\frac{1}{2}$	158	39	43.0	19.5	78	2,780	7,840	14,100
6	150	$6\frac{1}{2}$	170	45	49.6	22.5	90	3,180	9,000	16,200



As Might Be Surmised, the Fuel Consumption Per Pound of Metal Is About Uniform for Varying Diameters and for Both Square and Round Bars. Fuel economy, however, depends largely upon the expertise of the worker and upon the quality of the coal used.

Iron and Steel Exports Sharply Up

November Was Best Month (Except May) of Last
Seventeen—Imports Lowest for
the Year

WASHINGTON, Jan. 1.—Attributed chiefly to increased purchases by Japan for use in work of reconstruction, growing out of the recent earthquake and fire, iron and steel exports in November showed a substantial gain over October. The November exports aggregated 186,956 gross tons, valued at \$21,787,744, as against 152,511 tons in October, valued at \$19,244,049. Import figures for November showed a further decrease in incoming

For the 11 months ended with November of 1923 exports of iron and steel totaled 1,814,751 tons, valued at \$212,651,342, indicating that for the year 1923 total exports will be approximately 2,000,000 tons. For the corresponding 11 months of 1922 exports of iron and

Exports, January, 1922, to November, 1923, Inclusive (Gross Tons)

	All Iron and Steel	Pig Iron	Finished Material	Semi- finished Material
*Average, 1912 to 1914...	2,406,218	221,582	145,720	
*Average, 1915 to 1918...	5,295,333	438,462	1,468,026	
Calendar year 1919...	4,239,837	309,682	258,907	
Fiscal year 1920...	4,212,732	248,126	288,766	
Calendar year 1920...	4,961,851	217,958	216,873	
Fiscal year 1921...	4,168,619	129,541	82,549	
Calendar year 1921...	2,213,042	28,305	10,363	
January, 1922...	160,920	1,043	4,683	
February...	133,975	1,430	6,627	
March...	208,843	2,724	10,002	
April...	198,830	2,750	9,376	
May...	230,062	3,897	13,091	
June...	212,295	1,996	13,178	
Fiscal year 1922...	1,721,418	28,330	63,127	
July...	157,169	1,943	10,149	
August...	145,640	1,791	9,353	
September...	129,475	5,203	6,810	
October...	132,924	1,553	8,364	
November...	127,782	3,464	7,157	
December...	150,170	3,136	8,449	
Calendar year 1922...	1,986,297	30,922	107,201	
January, 1923...	123,190	2,482	10,563	
February...	133,902	2,786	7,733	
March...	163,920	2,881	11,416	
April...	177,471	1,844	11,247	
May...	203,389	1,848	12,822	
June...	171,183	2,960	9,652	
Fiscal year 1923...	1,816,329	31,891	113,377	
July...	168,558	2,966	6,480	
August...	161,426	3,117	9,684	
September...	172,499	2,148	8,366	
October...	152,511	3,294	10,989	
November...	186,956	3,198	8,342	
Eleven months...	1,814,751	29,563	107,298	

*Calendar years.

shipments of iron and steel, due largely to the falling off of foreign pig iron cargoes. The total of imports was only 26,364 tons, valued at \$1,941,331, as against 29,882 tons, valued at \$1,825,093, in October. The drop in November imports is especially marked when compared with the same month of 1922, when the aggregate was 141,176 tons, valued at \$4,370,717.

Imports of Iron and Steel into the United States

	(In Gross Tons)		Eleven Months Ended November	
	Nov., 1922	Nov., 1923	1922	1923
Pig iron...	98,767	9,299	328,717	355,465
Ferromanganese...	6,192	4,211	89,432	86,663
Ferrosilicon...	415	862	13,754	11,331
Scrap...	25,575	3,110	114,367	157,526
Steel ingots, blooms, billets, slabs and steel bars...	2,007	2,942	25,959	20,367
Rails and splice bars...	1,377	3,367	25,637	28,770
Structural shapes...	3,055	523	6,376	9,045
Boiler and other plates...	320	51	994	1,714
Sheets and saw plates...	274	233	364	2,468
Bar iron...	2,113	236	6,919	7,367
Tubular products...	308	465	614	4,160
Castings and forgings...	162	150	321	2,457
Nails and screws...	27	10	136	1,015
Tinplate...	33	108	2,335	9,846
Bolts, nuts, rivets and washers...	4	25	35	202
Wire rods...	120	294	1,448	3,611
Round iron and steel wire...	230	204	512	3,430
Flat wire and strip steel...	195	203	214	1,214
Wire rope and insulated wire, all kinds...	2	71	9	939
Total...	141,176	26,364	618,143	707,590
Manganese ore...	9,967	14,790	356,146	194,045
Iron ore...	160,141	77,654	967,935	2,611,240
Magnesite...	8,362	4,769	116,368	67,645

steel totaled 1,836,105 tons, valued at \$172,172,335, while exports in November, 1922, amounted to 127,782 tons, valued at \$14,248,464. Imports during the 11 months ending with November, 1923, were 707,590 tons, valued at \$28,971,373, and for the corresponding period of 1922 were 618,143 tons, valued at \$27,858,481.

Imports of iron ore last November amounted to 77,654 tons, while manganese ore imports for that month totaled 14,790 tons.

Exports of machinery in November were valued at \$25,218,724, as against \$24,893,616 in October. Imports of machinery in November were valued at \$581,072, compared to \$922,924 in October. Exports of machine tools in November totaled 4509 in number and \$698,459 in value, as against 4413 valued at \$783,777 in October.

Imports of Iron and Steel in Gross Tons

(Monthly Averages)

	Total Imports	Pig Iron	Ferro- alloys	Mangan- ese Ore and Oxide*
1909 to 1913, incl....	26,505	14,132	...	...
1914 to 1918, incl....	23,351	4,645	3,281	47,155
1919 to 1921, incl....	23,901	5,708	3,710	37,115
1922...	59,545	31,954	9,117	31,204
January, 1923...	120,078	83,935	5,120	829
February...	67,704	35,793	9,234	4,636
March...	106,197	72,344	9,030	12,799
April...	77,903	36,371	7,221	14,071
May...	75,885	39,764	10,482	12,734
June...	68,019	30,033	12,794	36,138
Six months' average...	85,964	49,706	8,980	13,535
July...	53,464	19,760	12,381	23,824
August...	45,439	14,564	7,334	23,026
September...	36,611	8,353	9,744	35,175
October...	29,882	9,349	9,372	16,842
November...	26,364	9,299	5,073	14,790
Eleven months' average	64,326	32,315	8,909	17,640

*Not included in "total imports."

†Includes ferroalloys.

‡Average for three years, 1916 to 1918 only.

Machine Tool Exports		October, 1923	November, 1923
Quantity	Value	Quantity	Value
114	\$321,105	128	\$151,003
79	102,054	266	75,555
10	19,954	22	19,500
13	35,885	37	64,000
7	10,608	65	65,656
54	73,198	32	36,871
56	46,890	21	12,672
26	29,021	15	6,961
17	8,491	45	12,821
...	...	3	9,346
189	69,300	355	130,381
3,275	29,187	2,254	28,056
573	38,084	1,266	85,637
Totals	4,413	\$783,777	4,509
			\$698,459

Machinery Exports from United States

(By Value)

	November, 1922	November, 1923	Eleven Months Ended November, 1922	November, 1923
Locomotives	\$383,509	\$460,032	\$7,957,065	\$3,996,267
Other Steam Engines	310,359	105,440	2,164,795	1,132,029
Boilers	90,906	163,297	1,157,907	1,291,742
Accessories and Parts	83,847	128,966	1,053,449	1,253,668
Automobile Engines	295,582	285,705	4,857,222	5,061,861
Other Internal Combustion Engines	323,028	578,420	3,884,226	6,357,366
Accessories and Parts for	198,702	274,741	2,490,123	3,168,391
Electric Locomotives	560,100	51,624	937,504	3,062,489
Other Electric Machinery and Apparatus	480,134	833,214	7,246,268	7,989,396
Excavating Machinery	114,631	136,182	1,359,636	1,483,319
Concrete Mixers	15,531	55,568	495,277	511,980
Road Making Machinery	20,382	90,134	318,817	860,972
Elevators and Elevator Machinery	341,712	310,370	2,447,654	3,114,505
Mining and Quarrying Machinery	657,016	976,724	5,817,983	9,266,908
Oil Well Machinery	326,732	661,559	3,908,343	6,129,315
Pumps	555,369	702,033	5,500,139	6,842,561
Lathes	41,123	151,003	670,056	1,011,525
Boring and Drilling Machines	57,670	75,555	528,658	665,631
Planers, Shapers and Slotters	19,975	19,500	267,770	232,846
Bending and Power Presses	12,417	64,000	293,383	359,926
Gear Cutters	11,707	65,656	104,525	204,360
Milling Machines	33,118	36,871	346,042	422,009
Thread Cutting and Screw Machines	34,926	12,672	182,435	461,718
Punching and Shearing Machines	2,848	6,961	137,503	168,629
Power Hammers	11,820	12,821	118,305	144,634
Rolling Machines	93	9,346	159,895	28,195
Sharpening and Grinding Machines	72,460	130,381	726,307	970,979
Other Metal Working Machinery and Parts of	427,060	302,634	5,030,671	4,322,608
Textile Machinery	730,421	817,669	12,877,366	8,542,444
Sewing Machines	819,113	794,206	6,411,729	8,202,885
Shoe Machinery	102,553	93,618	936,028	1,231,993
Flour-Mill and Gristmill Machinery	118,915	52,785	1,036,857	1,067,192
Sugar-mill Machinery	473,283	817,970	3,538,063	5,540,701
Paper and Pulp Mill Machinery	132,977	119,118	1,653,073	1,895,121
Sawmill Machinery	34,301	33,079	519,113	577,702
Other Woodworking Machinery	152,136	113,041	1,289,550	1,020,501
Refrigerating and Ice Making Machinery	190,962	175,020	1,709,994	2,091,377
Air Compressors	262,121	248,113	2,033,664	2,335,358
Typewriters	930,432	1,266,886	10,336,006	12,526,813
Power Laundry Machinery	51,888	99,350	604,301	922,421
Typesetting Machinery	346,817	398,839	3,531,532	3,469,149
Printing Presses	414,150	460,720	3,406,904	4,195,978
Agricultural Machinery and Implements	1,580,351	3,807,223	20,978,557	46,973,191
All Other Machinery and Parts	7,995,601	9,130,648	84,716,299	93,714,974
Total	\$19,818,787	\$25,218,724	\$215,934,485	\$264,813,719

Sources of American Imports of Iron Ore

(In Gross Tons)

	Nov., 1922	Nov., 1923	11 Months Ended Nov., 1922	Nov., 1923
Spain	6,994	1	46,930	214,891
Sweden	35,116	20,562	295,153	725,429
Canada	168	178	2,523	24,703
Cuba	45,157	13,300	321,646	660,679
Other countries	72,706	43,613	301,683	985,538
Total	160,141	77,654	967,935	2,611,240

Exports by Countries of Destination

(In Gross Tons)

	11 Months Ended Nov., 1922	11 Months Ended Nov., 1923	Tin Plate:	11 Months Ended Nov., 1922	11 Months Ended Nov., 1923
Plates:					
Canada	4,479	88,057	Canada	2,567	27,811
South America	33	1,106	Japan	3,142	27,592
Japan	168	985	Argentina	1,393	6,464
Cuba	2	861	Uruguay	291	3,324
Philippine Islands	570	711	China	1,834	9,829
Mexico	149		British India	2,284	6,465
Galvanized Sheets:			Chile	570	2,170
Canada	683	28,980	Cuba	476	4,509
Cuba	919	12,626	Mexico	514	2,167
Chile	92	2,790	Hong Kong	174	2,245
Argentina	605	4,931	Italy	1	2,267
Philippine Islands	1,007	7,241			
Central America	451	3,863	Barbed Wire:		
Japan	1,080	5,384	Cuba	536	8,850
Mexico	754	6,198	Argentina	897	8,019
Colombia	350	4,343	Australia	126	2,354
Black Steel Sheets:			Mexico	340	3,725
Japan	13,769	41,402	British South Africa	315	5,344
Canada	2,231	47,256	Colombia	272	3,987
Argentina	69	1,976	Brazil	2,377	10,491
Cuba	207	1,862	Canada	258	4,790
Philippine Islands	6	182			

United States Exports of Iron and Steel

(Gross Tons)

	Nov., 1922	Nov., 1923	Eleven Months Ended November
Pig iron	3,464	3,198	27,786
Ferromanganese	5	9	1,064
Ferrosilicon	49	79	493
Scrap	1,998	6,167	61,811
Ingots, blooms, billets, sheet bar, skele	7,157	8,342	98,752
*Iron bars	492	492	12,317
*Steel bars	10,536	12,365	158,952
Alloy steel bars	325	60	4,023
Wire rods	1,230	8,005	38,926
Plates, iron and steel	8,398	5,801	89,684
Sheets, galvanized	6,467	7,791	102,686
Sheets, black steel	5,290	17,188	209,434
Sheets, black iron	732	780	10,703
Hoops, bands, strip steel	2,827	2,955	30,755
Tin plate, terne plate, etc.	3,890	14,634	70,116
Structural shapes, plain material	11,580	9,103	119,427
Structural material, fabricated	3,416	8,799	42,147
Steel rails	20,950	26,900	261,624
Rail fastenings, switches, frogs, etc.	4,188	3,251	34,918
Boiler tubes, welded pipe and fittings	13,061	20,341	161,587
Cast iron pipe and fittings	3,091	2,548	25,208
Plain wire	5,205	8,736	105,511
Barbed wire and woven wire fencing	5,155	6,880	68,377
Wire cloth and screening	145	98	1,418
Wire rope	261	413	4,220
Wire nails	3,241	6,941	52,208
All other nails and tacks	604	575	7,777
Horseshoes	69	89	872
Bolts, nuts, rivets and washers, except track	1,375	1,444	16,533
Car wheels and axles	1,752	1,971	15,620
Iron castings	986	571	9,233
Steel castings	133	230	2,039
Forgings	159	200	1,999
Machine screws	43	43	204
Total	127,782	186,956	1,836,105
			1,814,751

*Not reported separately prior to Jan. 1, 1923.

Imports of Machinery

(By Value)

Nov., 1922	Nov., 1923	Nov., 1922	Nov., 1923
Metal-working machine tools	\$35,528	\$26,590	\$221,067
Agricultural machinery and implements	105,372	75,061	2,353,893
Electrical machinery and apparatus	112,603	142,790	540,380
Other power generating machinery	92,357	10,702	229,788
Other machinery	240,783	212,956	2,532,441
Vehicles, except agricultural	154,200	112,973	1,369,732
Total	\$740,843	\$581,072	\$7,246,801
			\$9,615,411

Galvanized Wire:

Japan	Argentina	Canada	Australia
2,408	1,094	1,016	1,016
12,364	1,272	1,290	1,290
13,856	3,207	1,83	1,83
6,530	4,205	1,032	1,032
9,036	9,755	1,52	1,52

Japan was the principal foreign buyer in November of galvanized sheets, black sheets, tin plate, rails and galvanized wire. Of the 17,188 tons of black sheets exported during the month, Japan took 13,769 tons.

England supplied 4203 tons of the total of 4211 tons of ferromanganese imported in November, the remaining eight tons coming from Germany. Of the 9299

tons of pig iron imported in November 6552 tons came from Canada, 1250 tons from China, 550 tons from British India, 350 tons from Scotland, 449 tons from Belgium and 148 tons from England. Of the manganese ore imports in November 8877 tons came from Brazil, 3940 tons from British India, 1920 tons from Turkey in Europe and 53 tons from Germany.

RIGHTS OF ASSOCIATIONS

Secretary Hoover Asks Attorney General for Opinion on Recent Decisions

WASHINGTON, Jan. 8.—Recent consent decrees by Federal courts, dissolving the Tile Manufacturers' Credit Association and the Cement Manufacturers' Protective Association, charged by the Department of Justice with violation of the Sherman anti-trust law, have created uncertainty in the mind of Secretary of Commerce Hoover as to the effect these two decisions will have as they relate to cooperation by trade associations with the Department of Commerce.

In an effort to obtain a clear understanding as to the prospect of the decisions interfering with trade associations providing the Department of Commerce with statistics, Secretary Hoover has requested Attorney General Daugherty to give his opinion as to the effect the decisions may have in this direction.

While there are those who think the decisions are applicable principally to the two associations affected, others who have studied the decrees interpret them as being so broad in their scope as to place rigid inhibitions upon some of the most ordinary practices of trade associations whose legality in the past was never seriously doubted. This latter view has developed a great deal of discussion as to the effect of the decisions not only in curtailing the great amount of important activities they are rendering in serving Government departments with information, but necessarily in restricting their own individual work, or possibly voluntarily dissolving. Whether or not the rulings will reach such a serious stage, the fact remains that the possibility of such a course has created no little concern.

It is recalled that both decrees in their permissive sections allow the gathering of vital statistics at Government request only, but not for distribution among members of the association, and, manifestly, it is pointed out, under this ruling there would be no incentive for the associations to continue their work, and, consequently, if the information desired by the Government is to be obtained, it apparently would have to do the work itself.

It is actually said that some Government officials who ordinarily are opposed to such activities by the Government feel that it might, in view of the decrees, have to turn to this work, or as an alternative, drop it altogether. It is recognized that the Government could not possibly gather the statistics so completely or distribute them so satisfactorily as can be done by the trade associations themselves. It so happens, however, that trade association work has been encouraged greatly along lines that certainly were considered legitimate and the result is that they are presenting Government departments, particularly the Department of Commerce, a great array of figures regularly, which are considered to be an important guide in the conduct of manufacture, distribution, and consumption, as well as the handling of stocks. It all fits in with the endeavor Secretary Hoover has undertaken ever since he has been in office, to cooperate with business interests of the country in governing the so-called business cycle by avoiding "peaks" and "valleys," planning out the cycle so as to bring about great uniformity in production and consumption, stocks, etc.

The Department of Justice has not yet replied to the request of Secretary Hoover as to the effect of the decree as it may involve cooperation with the Department of Commerce. The opinion of the Department of Justice is being anxiously awaited by business interests

of the country, not only because of the effect it may have on cooperation with Government departments, but on the actual existence of trade association work itself and its important relation to intelligent business conduct. After the cement decision was rendered, Attorney General Daugherty declared that it "embodies the most comprehensive and definite code of business ethics which has been laid down in any case arising under the Sherman anti-trust act during the period of 33 years that it has been on the statute books."

The strong expression of the Attorney General, following the decisions has been plainly a source of discouragement to business interests of the country, and it is obvious that if the reply of the Attorney General to Secretary Hoover throws any hopeful light on the question, it will be a source of much relief.

Program of Engineering Council Meeting

Herbert Hoover, secretary, Department of Commerce, Nicholas Murray Butler, president, Columbia University, and Dwight F. Davis, assistant secretary of war will be speakers at a dinner of the American Engineering Council of the Federated American Engineering Societies, to be held in Washington on the evening of Jan. 10. The dinner is part of the program of the Council's annual meeting which will be held at the Shoreham Hotel, Jan. 8 to 11.

Secretary Hoover is expected to discuss the work of the Department of Commerce as it relates to the nation's vast engineering projects, and Dr. Butler will describe the growing influence of engineers in modern life and their influence upon world affairs. Speaking on "The Industrial Preparedness Program of the War Department," Mr. Davis will tell how engineering organizations may be helpful in the execution of the national program. Dean Mortimer E. Cooley, University of Michigan, retiring president of the Council, will preside.

A central feature of the week's meetings is a public works conference to be held Jan. 9. The purpose of the conference is to urge the adoption by Congress of that part of the Brown plan of government reorganization which provides for the making over of the Department of the Interior, the proposed arrangement grouping the functions of the department under a division of public works and a division of the public domain. The U. S. Patent Office and the Bureau of Mines would be transferred from the Department of the Interior to the Department of Commerce. Both Secretary Hoover and Secretary Work, according to a statement of the Council, are in favor of the plan.

Sessions of the Council will be held Jan. 10 and 11. Subjects to be considered include the report of the committee on storage of coal, and proposed legislation relating to the coal industry. Reforestation, U. S. Patent Office reform, status of sanitary engineers in the U. S. Public Health Service, Secretary Mellon's tax reduction plan, establishment of a National hydraulic laboratory, engineering education, and relations with the engineers of other countries, will also be discussed.

The average weekly wage paid in November by the American Steel & Wire Co., Worcester, Mass., was \$156,000, the largest for any month since the World War. The annual payroll is on a basis of \$8,115,000. Officials expect 1924 business will necessitate a larger payroll. Every department of plant's three works is operating at capacity and some of them 24 hours per day.

Program of Annual Meeting of American Institute of Steel Construction at Pittsburgh

The annual meeting of the American Institute of Steel Construction to be held at the William Penn Hotel, Pittsburgh, Jan. 23 and 24, will be an industry, rather than a strictly membership, gathering, as invitation to attend has been extended to all interested directly or indirectly in the fabrication of structural steel. The tentative program for the meeting, besides the usual formalities, includes the report on the adoption of standard specification by Lee H. Miller, chief of the engineering department of the institute, and addresses on "Building for the Future in the Structural Steel Industry," by George H. Charls, vice-president and general manager United Alloy Steel Corporation, Canton, Ohio; "A Future for the Institute," by Charles F. Abbott, executive director, and "The Value of Public Interest in the Structural Steel Industry," by a speaker to be announced later on the first day.

At the banquet to be held on the evening of Jan. 23, Nelson B. Gaskill, chairman Federal Trade Commission, is scheduled to talk on "The Possibilities and Limitations of Trade Associations," and a speaker of prominence in the steel industry whose name and subject are to be announced is also listed.

For the second day's session, the program calls for a talk, "Selling as Applied to Contract Work," by John G. Jones, vice-president Alexander Hamilton Institute, New York. "Trade Customs and Business Ethics," is the subject of H. J. Kenner, general manager Better Business Bureau of New York. Walter Drew, counsel, National Erectors' Association, will talk on "The Benefit of Cooperation." An address in the form of a report on the resistance of steel construction in the Japanese earthquake is being arranged for.

Mechanical Engineers to Meet at Providence

The Providence section of the American Society of Mechanical Engineers will hold a meeting in Providence on the evening of Jan. 29. The program includes the following: "The A. S. M. E. and Industrial Mobilization," by Capt. L. P. Crim, executive assistant of the War Department, Boston District Ordnance Office; "The Investigation of Temperatures on Impact Value of a Group of Steels of Varying Compositions," by Dr. F. C. Langenberg; "X-Ray Examinations of Metals," by Gen. F. C. Dickerson, Watertown Arsenal, Watertown, Mass.

Meeting at Chicago of Associated States Opposing Pittsburgh Plus

CHICAGO, Jan. 7.—At a meeting here last week of representatives of 32 States comprising the executive committee of the Associated States Opposing Pittsburgh Plus, plans were formulated to induce other commonwealths among the 16 remaining States of the country to join the organization. It was brought out in the discussion by W. E. McCollum, assistant secretary of the association, that 57 colleges and universities have become interested in the Pittsburgh Plus case and are planning to inform their students of economics and marketing regarding the question. A short treatise on Pittsburgh Plus, recently prepared by the associated States, was sent to professors of economics in various institutions of learning, and the result has been a heavy demand for additional copies. The organization plans to prepare a revised edition which will include summaries of the testimony before the Federal Trade Commission by Dr. John R. Commons of the University of Wisconsin, Dr. Frank Fetter of Princeton University and Dr. Wm. Z. Ripley of Harvard University.

The work of the association in the year just closed was reviewed by members who had taken part in the extended hearings, and the future course of the case was outlined. The report of Examiner H. J. Bennett of the Federal Trade Commission will be ready about March 1, following which briefs will be presented by K. E. Steinhauer, counsel for the Federal Trade Com-

mission, and H. G. Pickering, Superior, Wis., counsel for the associated States. The United States Steel Corporation will file a brief in reply and the case will then be argued about June 1. It is expected that a decision will be rendered by the Federal Trade Commission before the next Presidential election.

Brass Manufacturers Uphold Mellon Plan

The National Association of Brass Manufacturers, having decided at its recent convention in New York to approve the stand of President Coolidge and Secretary of Treasury Mellon on income tax reductions, has sent the following telegram to the President:

The National Association of Brass Manufacturers in convention assembled, cordially and unanimously approve your stand on tax reduction. We are unalterably opposed to a soldier's bonus and we favor providing liberally for all disabled and needy soldiers, but to go farther than to so provide will call for additional taxes and thereby not only defeat the very purpose of tax reduction, but a more economical administration of governmental affairs. Therefore we heartily endorse your position on this matter.

Joint Safety Meeting at New York

A joint meeting of the engineering section of the National Safety Council and the American Society of Safety Engineers will be held Jan. 22 at the Engineering Society Building, 29 West Thirty-ninth Street, New York. Handling material and gas and electric welding will be the subjects featured on the program, which includes the following papers:

Eliminating Material-Handling Accidents by the Use of Conveyors—George C. Agry, assistant industrial sales manager Lamson Co., Syracuse, N. Y.

Eliminating Material-Handling by the use of Trucks including Lift Trucks—A. L. Lewis, President, Lewis Shepherd Co., Boston.

Safety in Electric Welding and Cutting—D. H. Deyoe, General Electric Co., Schenectady, N. Y.

Safety in Gas Welding and Cutting—H. S. Smith, Union Carbide & Carbon Corporation.

The Hazard of Fuel Oil for Domestic Heating Purposes—Peter Spence, Chief Fire Prevention Bureau, New York.

Annual Meeting of Rogers, Brown & Co.

The forty-fourth annual meeting of Rogers, Brown & Co. was held at the Cincinnati office, Jan. 3, 4 and 5. Business meetings were held on each of the three days, and on Thursday the annual banquet at the Business Men's Club. Oswald Fowler, New York, was admitted to the firm as a junior partner, during the session. A feeling of optimism regarding the present year's business was noted at the sessions, it being the general opinion that the year 1924 will be a more successful and profitable one than the year just closed.

COMING MEETINGS

January

Federated American Engineering Societies. Jan. 10 and 11. Annual meeting at Washington. L. W. Wallace, 719 Fifteenth Street, N. W., Washington, secretary.

Gas Products Association. Jan. 17, 18 and 19. Tenth mid-winter convention, Blackstone Hotel, Chicago. C. T. Price, 140 South Deaborn Street, Chicago, secretary and treasurer.

American Society of Safety Engineers. Jan. 18. Annual meeting in New York.

Society of Automotive Engineers. Jan. 22 to 25. Annual meeting, General Motors Building, Detroit. Coker F. Clarkson, 29 West Thirty-ninth Street, New York, general manager.

American Society for Steel Treating. Jan. 31 to Feb. 1. Winter sectional meeting, Rochester, N. Y. W. H. Eisenman, 4600 Prospect Avenue, Cleveland, secretary.

Improved Journal Truing and Axle Lathe

An improved type combination journal truing and axle lathe, the general construction of which may be noted from the accompanying illustration, has been developed by the Betts Machine Works of the Consolidated Machine Tool Corporation, Rochester, N. Y.

This machine is equipped with two carriages for turning outside journals with the wheels mounted on the axle. The gaps in the bed for swinging the wheels have finished surfaces, and separate filler blocks are provided for insertion in these gaps when the machine is used as an axle lathe. When the blocks are inserted, the carriages have ample travel for turning both the wheel seat and journal fit, also finishing the fillets of the axle, and burnishing.

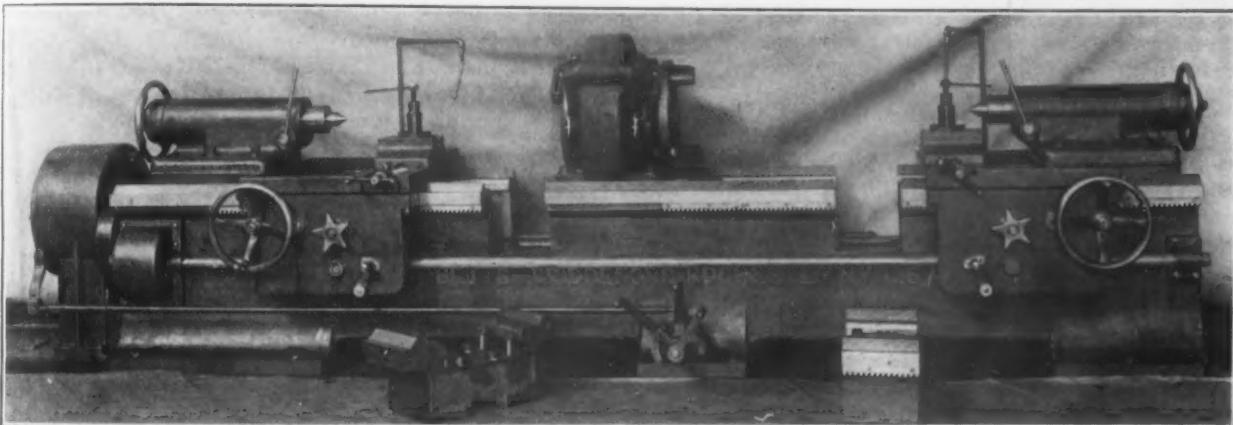
The center driving head is of the opening type to permit axles with wheels mounted to be placed on the centers. The large driving gear is in two halves, has coarse pitch and wide face teeth and rotates in two large bronze bearings, one on either side of the center. The pinion meshing with the large gear runs in oil and

system, starting, ignition and lighting, radiators, radiator shells, hub caps, bushings, bearings instruments, windshield trim and fittings, headlights, tire valves, hardware, body trim, bolts, screws, nuts, rivets, etc., as well as a wide variety of special fittings and mountings.

"The amount of copper in each type of car varies widely, the lowest being about 18 lb., and the highest 750 lb. Within these two extremes, the 'average' car may be said to carry about 50 lb. of copper in all forms. Closed body models use much more copper than open models, in the form of additional brass hardware and brass and bronze parts in window and curtain mechanism, as well as extra body trim."

New Seamless Steel Tube Plant Being Equipped

The Seamless Steel Tube Co. of Wisconsin, organized several months ago with capital of \$400,000, has taken over a plant at Appleton, Wis., formerly used for



Combination Journal Truing and Axle Lathe. The machine is provided with two carriages for turning outside journals with the wheels mounted on the axle. Sections of the bed may be removed for swinging wheels

is mounted on a heavy shaft located in the center of the bed and driven from speed change gears located in left-hand end of the bed. Three speed changes are available through hardened steel sliding gears running in oil. Speed changes are made from the center of the machine. The carriages are driven from a splined feed rod through steel gears, giving a range of four feeds. Feeds are also changed from the center of the machine.

When the machine is driven by a single pulley or alternating-current motor, the drive is through a friction clutch and automatic brake, which is operated from center of machine, giving the operator complete control from his normal working position. When driven by direct-current motor, a dynamic brake in the controller is used for quick stopping, this being controlled by means of a conveniently mounted push-button station.

Either 45 in. or 55 in. swing in the gaps may be provided and axles of various lengths may be accommodated as both tail stocks are adjustable along the bed and the carriages have sufficient travel to accommodate the longest journals.

Copper Consumption in Automobiles

The Copper and Brass Research Association places the total 1923 consumption of copper in cars, trucks and accessories, at 170,000,000 lb. This is an increase of 61,720,000 lb. over 1922 and of 90,000,000 lb. over 1921. The copper content of the American car or truck varies all the way from 18 to 750 lb. This total consumption indicated includes not only the amount of metal carried by the finished stock car, but also the copper used in repair parts, replacements, special body work, accessories and in the increasing number of closed body models. The association's statement says:

"The importance of copper in the automobile today is apparent when we consider the parts in which it is used, either wholly or in alloys with other metals, as brass, bronze, etc. Such parts are the entire electrical

the manufacture of motor trucks, and is converting it to its purposes. Equipment has been purchased and the new plant will be ready for operation in six or eight months. The plant will have 60,000 sq. ft. of floor space and will make steel tubes from 3 in. down to the smallest sizes.

Equipment which has been bought includes one piercing mill and furnace, break-down mill, three finishing mills, 12 draw benches, six straightening machines and three annealing furnaces.

George J. Thust, who was connected with various plants of the United States Steel Corporation for 17 years, and whose inventions have helped in the development of the manufacture of seamless steel tubing, will be in charge of manufacturing operations for the company. Mr. Thust installed seamless steel tube plants for the following companies: Greenville Seamless Tube Co., Greenville, Pa.; Newcastle Tube Co., Newcastle, Pa.; Detroit Seamless Tube Co., Detroit; Globe Seamless Tube Co., Milwaukee, and installed piercing mills for the Shelby plants at Shelby and Toledo, Ohio.

Direct Steel Process in the Ford Motor Co.'s Operations

The statement has been published recently that the Ford Motor Co. will erect a plant at River Rouge, Mich., for the production of steel direct from the ore. The Bourcoud process was mentioned as having been decided upon.

The Ford company informs THE IRON AGE that some investigations on the direct reduction of iron ore are being made which will require the demonstration of some of the problems to a limited extent. The company is not confining itself to any specific theories or methods, but will follow leads which seem to have promise.

FREIGHT RATE HEARING

Complaint of Jones & Laughlin Steel Corporation Is Being Investigated

PITTSBURGH, Jan. 7.—Several days already have been given to the hearing in the complaint of the Jones & Laughlin Steel Corporation that railroad freight rates on steel products from the Pittsburgh district to Illinois and Indiana destinations were unduly prejudicial as compared with those from Indiana and Illinois points to destinations within those two States and into St. Louis. It is probable that the hearing, which began Jan. 3, before Examiner William A. Disque, interstate Commerce Commission, will continue late in the week to permit all interested to present their case. Representatives of the steel companies in Youngstown, Buffalo and Johnstown have intervened in an effort to preserve the present differentials in the event that the prayer of the Jones & Laughlin Corporation is granted. All of the railroads which would be affected by a change of rates on westbound shipments are represented at the hearing, as are also the steel companies in the two States, whose freight advantage would be reduced in case of a decision favorable to the complainant.

Briefly, the Jones & Laughlin Steel Corporation seeks rates out of Pittsburgh into Indiana, Illinois and St. Louis more in harmony with the rates now prevailing from mills in Indiana and Illinois. The latter have commodity rates on practically all products and they are relatively lower than the Pittsburgh rates, which are upon a fifth class basis.

F. A. Ogden, traffic manager Jones & Laughlin Steel Corporation, the first witness, who was on the stand all day on Jan. 3 and most of the next day, asserted that if not only his own company but others in the district were to be able to get into the disputed territory, they should have rates of about 65 per cent of the present fifth class rates. This, he said, would not put mills in this district upon an even footing with Middle Western producers, but would reduce the penalty now imposed upon Pittsburgh mills in their effort to ship into the disputed territory by the difference between class and commodity rates. He attacked the inconsistency of this arrangement, which, he said, was entirely favorable to Middle Western mills. He introduced many tabulations, not the least interesting of which was one showing the rates from Indiana or Illinois points to several destinations and then contrasting this with the rates from Pittsburgh to destinations of equal distance. The difference in favor of the Middle Western producers ran from 9c. to 11c. per 100 lb. He showed, for example, that it costs 19½c. per 100 lb. to ship steel from Fort Wayne, Ind., to Alton, Ill., a distance of 314 miles and 30½c. from Pittsburgh to Rushville, Ind., a distance of 341 miles.

H. C. Crawford, assistant traffic manager of the Bethlehem Steel Co. at Johnstown, Pa., requested that if rates on iron and steel shipped from this district are revised, the rates at Johnstown be subject to the same revision. Practically the same request was made by Harry Rhodehouse of the Youngstown Chamber of Commerce, in behalf of the steel and iron manufacturers of the Mahoning and Shenango valleys. Several iron and steel manufacturers of Buffalo were represented by J. B. Daly, traffic manager Donner Steel Co., who asked that the parity of freight rates on shipments made from Buffalo and Pittsburgh to points in Indiana and Illinois be maintained if revisions are made in the Pittsburgh district.

The fact that iron ore, coal and limestone are transported into the Pittsburgh district at a comparatively cheap freight rate was given as the reason for the comparatively high freight rates on iron and steel products by O. S. Lewis of Baltimore, freight traffic manager of the Baltimore & Ohio Railroad, on Friday. He said it was no more than fair that the industry that had the advantage of cheap freight rates should shoulder a large percentage of the burden of keeping the railroads prosperous. Under cross examination, however, he admitted that the volume of iron and steel

shipped from this district to St. Louis and contiguous territory had fallen off the past eight or ten years, and this condition at least was partly due to the high freight rates on the products shipped from this district.

In explaining the establishment of commodity rates by railroads, which are generally cheaper than the usual rates, Mr. Lewis said one or more of three considerations usually entered into the fixing of such a rate, namely, that the industry manufacturing the product shipped had been established recently; that competition with waterways entered in or that the industry was situated in an unfavorable place from a geographic standpoint. He said he did not believe any of these conditions figured in the transportation of iron and steel from the Pittsburgh district.

Frank Smith of New York, a member of the official railroad classification committee, and W. C. Glynn of Pittsburgh, assistant freight manager of the central region of the Pennsylvania Railroad, also aided in presenting the case of the railroad companies. Defense of the commodity rates enjoyed by Middle Western companies was made Monday by representatives of these companies, who asserted that they had located where they did because of the favorable freight inducements.

Decreased Demand for Labor at Iron and Steel Plants in Pennsylvania

HARRISBURG, PA., Jan. 7.—Decreased demand for employees in the iron and steel trade is reported by the various employment districts of the Pennsylvania Department of Labor and Industry in the semi-monthly report to Secretary Royal Meeker. Some districts attribute the reduced demand to the holiday season, while some are inclined to expect greater activity during the early months of 1924.

Philadelphia reports that Cramps Shipyard has added electricians on ship installation work and sheet metal workers, while shipfitters and shipfitters' helpers are being placed at the Navy Yard. The Westinghouse Electric & Mfg. Co. is adding some workers, and there has been fair demand for tool and diemakers.

Harrisburg reports that the Steelton plant of the Bethlehem Steel Co. has been employing good laborers and is eagerly seeking patternmakers, templet makers and some other skilled workmen. Iron and steel mills generally in this district have recovered somewhat from the slump of the last several weeks.

Erie, which blames some of the recent slump on the holiday season, forecasts increasing business, particularly among the foundries. There is demand for patternmakers and diemakers. Johnstown reports a slackness in common labor. Observers at Pittsburgh find a surplus of iron and steel workers, but an early revival of demand for workers is expected. An unusually large number of men is now unemployed.

Scranton finds no outlet for the increasing number of railroad shopmen applying for work, with the Delaware, Lackawanna & Hudson shop strike still unsettled and layoffs reported from virtually all other shops. Reading has had few demands for metal workers.

Stock Offered Steel Corporation Employees at \$100 Per Share

In accordance with its stock subscription plan heretofore adopted, the United States Steel Corporation has decided to offer to its employees the privilege of subscribing during the month of January, 1924, for 100,000 shares of common stock at the price of \$100 per share. While the offering amounts to 100,000 shares, it is not limited to that figure, because as in the past the corporation will honor all the subscriptions received. Last year 60,000 shares were nominally offered at \$107 a share and 49,150 employees subscribed for 100,730 shares. Twenty years ago Steel common sold below \$10 a share. The initial sale on the exchange took place on March 28, 1901, at 43½. On May 13, 1904, it sold down to 8½, and made a record high of 136½ on May 31, 1917. The closing quotation Monday was 100.

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The Anti-Statistics Campaign

ECONOMISTS, sociologists, managers of business and labor leaders, or let us say simply producers and consumers, agree that equilibrium in industry is a most desirable thing to bring about. That is what the experts mean, when in the fashion of the day they talk of smoothing the business cycle. The only way of doing this is to throw light upon the conditions of production and consumption. That manufacturers in many industries became willing to cooperate for this purpose, appreciating its value, was one of the few good things that emerged from the war.

It was, perhaps, inevitable that a few of these industrial associations, out of the hundreds of them, should make their cooperation a disguise for controlling markets and prices, or attempting to do so. Several of these have been prosecuted by the Department of Justice for violation of the Sherman law and the courts have decreed that certain practices were illegal and have forbidden their continuance.

Unfortunately the Supreme Court confined itself to the merits of each case and avoided the declaration of general principles. This produced an uncertainty of status that has scared a good many business men and has checked the progress of economic efforts in fields where the possibilities of valuable work have been visualized. Secretary Hoover tried in vain to persuade Attorney General Daugherty to state plainly to business the attitude of the Department of Justice. The Secretary himself proposed the doubtful formula of immunity from danger if industrial associations should communicate their data to the Department of Commerce for publication by it.

Recently there have been consent decrees in two of the lower courts wherein it has been held that the mere collection of statistics and dissemination of aggregates is illegal, inasmuch as they may enable a regulation of production so that supply will always be behind demand! This is so preposterously in violation of common sense that many industrial associations have refused to be frightened by it. But Secretary Hoover has risen to the occasion by politely suggesting to the Attorney General that if there be merit in the decisions the latter recently has obtained will he please advise whether the Department of Commerce in its profuse publication of the production and stocks

of commodities is itself violating the Sherman law.

If the Attorney General's reply should be in the affirmative, the ruling would apply to every industrial association, irrespective of whether it publishes its statistics or not. Similarly to every newspaper, every institute and every economic bureau. Indeed, there would be danger to the practice of many professional men. In other words, a ban would be put upon knowledge lest producers should see fit to curtail production. This would be a veritable *reductio ad absurdum*. It would be as wise as to decree that no firearms should be made lest murder might be done with them.

The Supreme Court has made two decisions bearing upon this subject—in the Hardwood Lumber case and the Linseed Oil case—in both of which violation of the Sherman law was found, but not because of the collection of statistics *ipso facto*. There was nothing in those decisions to intimate that the mere collecting and reporting of statistics of production and deliveries, or for that matter much more, is in any way illegal, but collusory action by producers for the influencing of prices would be. This is to say, that it is not the development of facts that is contrary to the Sherman law, but subsequent actions, which even then must be collective, or substantially so, and contrary to public interests.

This is obviously common sense and in conformity with previous decisions of the Supreme Court that the Sherman law must be interpreted and applied according to rules of reason.

As we see it, there is no reason under the sun why producers are not free to learn the facts of economic situations that concern them; and knowing the facts, no reason why they should not either curtail or increase production, acting independently. Even given the facts, different persons will interpret them differently, as experience has amply shown, and will conduct themselves differently. Statistical revelations are just as often an inspiration to producers to increase production and restrain rising prices as to curtail production and restrain falling prices.

The field of statistical investigation and the effort of industrial associations is not limited to the position of producers alone. It includes studies of consumption and cooperation with consumers, all with the object of throwing light into

places that used to be dark and dangerous, and thereby promoting equilibrium in industry and common welfare. Does the Attorney General consider this to be prohibited by the Sherman law? **Would he extinguish the lights upon the highways and let traffic destroy itself?**

We do not think there is any need for modification of the Sherman law for clarity with respect to permissible practices, in so far as the statistical and industrial associations, institutes and journals are concerned, so much as there is need for common sense in the Department of Justice in considering the nature, object and position of statistical work.

Automotive Expansion

THE importance of the manufacture of automobiles to the steel industry is indicated by the tabulation in **THE IRON AGE** of Jan. 3 (page 5) showing that 11 per cent of our 1923 output of finished steel products went for automotive purposes. There is scarcely a great industry to which the manufacture of automobiles, now but little more than two decades old, does not contribute. Apart from steel there are aluminum, copper, plate glass, lead, tin, nickel, upholstery leather, cotton and wool, lumber, paint and varnish, coal, petroleum, cement, asphalt, rubber, and the prosperity of each of these lines has a more or less important reflex upon the manufacture of steel.

There is no parallel to the remarkably rapid growth of the automobile industry, with the possible exception of petroleum, and there the development has been coincident with and largely due to the greater use of motor cars. The 1923 output of cars and trucks, exceeding 4,000,000, establishes such an increase over that for 1922, which was about 2,660,000, that it is not surprising that the much-talked-of saturation point is more emphasized. Cars and trucks owned in the United States now number more than 14,000,000, there being an average of one vehicle for every 8 persons. In California there is one car for every 3 persons, while Alabama has only one for every 26.1 persons and Mississippi only one for every 23.1. It is these higher figures which encourage the automobile manufacturers, there being 25 States in which the number of automobiles is less than the average. Some manufacturers hold that the time is not long distant when 25,000,000 automobiles will be in use. The Ford Motor Co. is speeding up its production to 10,000 cars a day, or at the rate of 3,000,000 a year. Moreover, cars are becoming cheaper, and a statistician of the industry points out that every reduction of \$50 in the selling price of a car means a million more people who are able to own one.

As to the future of the industry it is pointed out by a large manufacturer that "when the country has all of the cars it is able to absorb the replacement business will be ample to keep the factories going."

IT is to be hoped that the tentative plan of the Ford Motor Co. to investigate the most meritorious processes for the production of steel direct from the ore may develop to the point of a thorough try-out. The Ford organization has

its own ore, coal and coke as well as the equipment necessary for such an undertaking and it has practically limitless resources. The manufacture of steel direct from the ore has challenged metallurgists for many years and several ambitious plans have been proposed. In the face of remarkable developments in other fields, it would be rash to predict failure in this.

A Billion Gain in Foreign Trade

DEPARTMENT of Commerce figures covering eleven months ended Nov. 30, 1923, show exports aggregating \$3,739,815,329, compared with \$3,487,449,909 in the previous year. Imports for the eleven months amounted in 1923 to \$3,503,954,911, compared with \$2,818,958,260 in the previous year. As commodity prices were not far different in the two years, the figures are comparable. It will be noted that the excess of exports in eleven months of 1923 was \$236,000,000, compared with an excess of \$669,000,000 in 1922 (\$719,000,000 in twelve months of 1922).

Thus the total foreign trade of the country in 1923—estimating December as equivalent to November—amounted to \$7,935,000,000, a gain of approximately \$1,000,000,000, or one-seventh, over the 1922 total of \$6,944,480,965.

The significance of this gain is that it has been made in the face of world conditions involving much unemployment, dislocation of exchange and political unrest. While our foreign trade always has been a small percentage of our total trade, the volume still is large enough to make at times a noticeable difference in the degree of prosperity and in some industries to turn the scale on the side of profit.

Sound Thinking Needed

IS the world making progress? The question naturally confronts thoughtful people at the beginning of a new year. It has come up many times, but every year the answer must be adapted to changing conditions.

In 1907, in an address before the Harvard Chapter of Phi Beta Kappa, the Hon. James Bryce, a statesman whose thoroughness of scholarship, clearness of vision and fairness of judgment have seldom been equaled, expressed confidence that material progress has increased and that there has been an immense gain in knowledge; but he thought it impossible to say whether the creative powers of the human mind had improved or deteriorated and he believed it equally impossible to say whether there had been any gain in human happiness. In an address delivered at Birmingham, England, in 1916, Lord Bryce asserted that the chief cause of the progress of mankind is the exercise of creative thought, for it has produced literature, philosophy, art and religion, the chief things that make life worth living. He said that the future progress of mankind lies in friendly co-operation, in the healing and enlightening works of peace and in the cooperation of the spirit of friendship and mutual confidence which may remove the causes of war.

Prof. Bliss Perry recently has pointed out that

the address of 1916, although written in a dark hour, is more confident in tone than the address of 1907, for the author is not only sure of the fact of progress but of the road by which humanity must travel in order to advance.

Since Lord Bryce spoke in 1916 there have been many developments of tremendous importance, and men are inquiring more eagerly than ever whether the world is going backward or forward.

Some days ago, in an address before the Pennsylvania Society in New York, James M. Beck, solicitor-general of the United States, gave an able address in a rather pessimistic vein, comparing a copy of the *New York Times* of twenty-five years ago with one of a few weeks ago, showing not only that our newspapers deserve much unfavorable criticism, but that they reflect a demoralizing tendency in the American people. Probably the most important criticism, especially for men in the business world, is found in a declaration of Mr. Beck that today "the mind of man is little more than a moving picture show upon whose screen events are momentarily flashed with lightning rapidity, so that the average man today is so hopelessly confused by the multiplicity of subjects that he cannot concentrate on any great public issue as he did 100 years ago or even twenty-five years ago."

Mr. Beck referred to the radio, rapid transportation, excessive indulgence in sports and other distractions as tending to prevent men from giving anything careful and thorough consideration.

Painted in the vivid colors used by Mr. Beck, the picture is one that arrests attention. That many of our people find it increasingly difficult to resist the fascinating distractions of the times cannot be denied. It is a perplexing question how to make these less dominating in our life and to give more place to the things of the largest consequence. The sports of which Mr. Beck complains rather bitterly have done much to make life more tolerable for men upon whom the exactions of modern business have been severe. The question is, when does the indulgence in these sports become a wanton waste of time? Similar questions confront those who enjoy the automobile, the radio and the moving picture. In the business office there are countless interruptions which make war on sustained thinking.

Just how some urgent modern problems, social and industrial, are to be solved is far from clear; but it is certain that they will not be solved without a great deal more thinking than the average business man is putting upon them today. Granted that to a greater extent than ever serious study is being given to some of these matters of large concern—albeit only a small minority of so-called men of affairs are thus interested. Yet in the problems of human relations in industry, for example, only the first steps have been taken, important though they be, such as reducing hours of labor and putting employees on a conference footing with management. Much must be done toward removing the causes of the wasteful wars in industry. Sound thinking must undo the work of prejudice, and with sound thinking there must be, as Lord Bryce says, the spirit of friendship and mutual confidence.

Our Steel Making Capacity

IT has been pointed out frequently that since 1916 the physical capacity of the steel-making units of the iron and steel industry has been a matter of much less consequence than formerly, because operations have been hampered in various ways, whereas it used to be the rule that when the capacity existed it could be operated, if the mills had the orders.

Whenever the steel mills were well filled with orders an opportunity was afforded to see just what their actual capacity was. This was, of course, less than the sum total of the rated capacities as supplied to the iron and steel works directory, published for many years by the American Iron and Steel Association, and afterward by the American Iron and Steel Institute. By comparisons between production when mills were running "full" and the reported capacity at the time, a factor could be computed whereby actual capacity could be estimated at other times without the test of actual performance.

Late in 1916 a shortage of coke developed, so that, although the mills had an enormous volume of business on books, they could not operate in full. There was more potential blast furnace capacity in 1917 than in 1916, but less pig iron was made. From late in 1916 to late in 1922 there was restriction of operation from outside influences every time the mills were filled with orders. Transportation was insufficient on many occasions, there was labor shortage and there were important strikes, particularly the iron and steel strike of late in 1919, the coal strike immediately following, and the coal strike of 1922.

The means of checking up steel-making capacity by actual performance, supplied at intervals before 1916, has since been lacking, and as it may not be possible to operate capacity, it is not so important to know nowadays what the capacity is. Still, as we hope to get back to normal, it is worth while to keep track of the matter.

In *THE IRON AGE* of Jan. 20, 1921, certain comparisons were made whereby it was concluded that the best guess as to actual capacity at that time was approximately 52,500,000 tons per annum of steel ingots. A similar estimate made before the war would have meant that the steel industry would actually be able to make the tonnage stated. In 1906, for instance, there was full operation, and production and capacity were identical.

Three years having elapsed, the old estimate may be brought up to date. Our summaries of new construction have shown additions to ingot capacity rated at 247,500 tons for 1921, 227,500 tons for 1922 and 850,000 tons for 1923, a total of 1,325,000 tons. Some allowance should be made for obsolescence, but on the other hand ways have been found of increasing output per furnace. Thus present capacity may be taken at about 54,000,000 tons, given good working conditions such as were normal and usual before the war.

The difference between old and recent conditions is well recognized in all trade circles, although perhaps unconsciously. Before the war an 85 per cent operation of the steel industry was

thought of as only moderately good. A 75 per cent operation was distinctly poor, and an operation much under 60 per cent was almost unthinkable. A 100 per cent operation was not unattainable, and indeed was maintained throughout the year 1906. Of late an 85 per cent operation has been considered decidedly good, and a 75 per cent

operation not at all poor. A 100 per cent operation would be considered a phenomenon. The steel industry is now so large that a full supply of labor and transportation could hardly be expected in that industry if the country were so busy as to call for the amount of steel that would be involved.

RUSSIAN PRODUCTION INCREASES

Export Encouraged—Industry Complains of Taxation—Concessions to German and French Groups

BERLIN, GERMANY, Dec. 15.—The Moscow Council of National Industry has published a résumé showing how the national iron and steel industry is to be benefited by the new policy of forcing export and restricting import. The new tariff, prepared but not yet enacted, establishes high duties on such metal products and articles as Russia produces, or could produce, while it encourages the import of necessary metal goods. As a result of the encouragement of food exports, the foreign trade balance is improving. Krassin estimates an export surplus of 200,000,000 gold rubles in 1924.

The increasing supply of Germany with rye and wheat is accompanied by metallurgical concessions or leases to Germans. German engineers are reported to have reorganized the Nevski Shipbuilding & Mechanical Works at Petrograd. The Russo-German "Russgertorg" corporation, behind which is the Wolff (Cologne) syndicate has concluded a contract to supply machinery and technical equipment to the "Donugol" (Donetz coal trust). This month German steel and coal companies concluded a contract providing a credit of 1,600,000 gold rubles to the Russian State Machine Corporation, the Electrical Corporation and other interests, the credit to be spent on German machinery. The director of the Machinery corporation, further, when in Germany, made an agreement with the General Electricity Co., and a contract for electric lamps with the German Osram Corporation.

The French have obtained an important ore and coal concession, to be worked by the same French interests which prior to the war worked at Krivoi Rog.

The pig iron famine, reports the official *Ekonomitcheskaya Zhizn*, is worse than ever. On Jan. 1, 1922, the reserve of pig iron in all Russia was only 15,000,000 poods (about 241,000 gross tons); on June 1 it had fallen to 11,000,000 poods, and on Sept. 1 to 7,500,000 poods. Precise figures of production are now available up to Sept. 1; as usual they do not agree with earlier official figures; but they agree with the earlier figures in showing an increase of output.

Russian Production in 1923

1923	Pig Iron, Gross Tons	Steel Ingots, Gross Tons
January	27,032	38,185
February	23,946	35,357
March	30,214	46,141
April	20,526	45,144
May	22,242	61,537
June	23,512	62,678
July	24,894	53,694
August	27,337	52,875

According to the official *Ekonomitcheskaya Zhizn*, the Donetz coal production in the year ended Sept. 30, 1923, was 470,000,000 poods (about 7,500,000 gross tons), which is a record since the revolution. The same publication states that in August 159 coke ovens were operating, producing about 1,000,000 poods of coke. The total coke production in 1913 was 278,400,000 poods (about 4,500,000 gross tons).

The official program for 1923 foresaw a monthly iron-ore production of 3,250,000 poods. For the new fiscal year beginning Oct. 1, 1923, the coal production in the Donetz basin is estimated in the official program at 640,207,000 poods. The production program for 1923 to 1924 of the Jugostahl trust (Southern Steel Corporation) is said to provide for a 200 per cent increase over 1922 to 1923, including 18,000,000 poods

of pig iron, and 40,000,000 poods of open-hearth steel, bars, sheets, etc. The Southern Steel Corporation announces that in 1923-1924 it will, for the first time, cover its expenditure.

All the iron and steel companies complain of the burden of taxation. A petition to the Soviet Government states that central government taxes amount to 17 per cent of value of production, and that all taxes, including local, amount to 30 per cent. Although industrial production averages but one-third of 1913, the tax yield in 1922 to 1923 was 113,650,000 gold rubles, against 118,000,000 gold rubles before the war.

Apart from the chronic shortage of pig iron Russia has a great and increasing demand for bars, girders, wire, hardware, nails and pressed metal products. The proprietors of leased plants declare that the price commission has enforced rates at which, in view of the heavy taxes and the overhead charges caused by government control, it is impossible to sell. Prices are being revised. Present prices quoted for 1 pood by the Jugostahl are: Foundry pig iron, 1.65 gold rubles (about \$50.85 per gross ton); ingots, 1.45 rubles (about 2c. per lb.); billets, 2.20 rubles (about 3.10c. per lb.); structural shapes, 2.80 rubles (about 4c. per lb.); steel rails, 2.82 rubles (about 4c. per lb.).

The industrial budget for 1923 to 1924 drawn up by the Council of National Economy estimates the value of production of the whole metal industry at 349,700,000 gold rubles, or approximately \$175,000,000.

The thirty-first annual banquet of the New England Iron and Hardware Association will be held Thursday evening, Jan. 24, at Hotel Somerset, Boston. William H. Bowe is chairman of the committee of entertainment.

The Iron Age and Its Readers

For framing purposes or for use under the glass top of the office desk a reprint has been made of the outstanding features of the analysis "Where Steel Went in Nineteen Twenty-three," given in the Annual Review Number of THE IRON AGE last week. This will measure about 12½ x 18 in., and will be sent without charge to readers who request it.

Incidentally, it is worth noting that our estimate of last year's output of steel ingots at 43,250,000 tons is about one-half of one-tenth of 1 per cent higher than the total as reported elsewhere in this issue from the compilations of the American Iron and Steel Institute.

Extra copies of the colored charts of price fluctuations that formed one of the features of the Annual Review Number may be had also on request, together with a reprint of the eight pages of prices accompanying the charts. There are three charts: one of pig iron and various forms of finished steel, another of copper and other non-ferrous metals, and the third, of the IRON AGE composite prices of pig iron and steel, together with steel billet and steel rail composites. The tables cover the monthly average prices since 1902 of more than 50 products.

GERMAN IRON AND STEEL MARKET

Foundry Iron Drops More Than 20 Per Cent Below Last Month—About on World Level

(By Radiogram)

BERLIN, GERMANY, Jan. 7.—Foundry pig iron No. 1 is now priced at 90 gold marks per metric ton (\$21.78 per gross ton).

One week ago the price was given as 116 gold marks per metric ton or \$28.05 per gross ton. The two figures may be compared with last week's figure of \$23.11 for Cleveland No. 1 foundry pig iron (Great Britain) and with \$22.75—the foundry iron component of THE IRON AGE composite price of pig iron.

RUHR WORKS RESUME OPERATION

Currency Stability and Government Economy Bring Optimism—New Federal Economic Council

BERLIN, GERMANY, Dec. 19.—With exchange stable at present, there is a more optimistic tone throughout industry. Present conditions are regarded as the beginning of a period of recovery. The Government is dismissing employees in all branches and has reduced salaries in an effort to balance the budget. Some industries are also reducing wages as prices of foodstuffs have declined, the mining industry having decreased the extra 25 per cent pay for high cost of living to 10 per cent. Negotiations for an increase in working hours continue and 1 hr. of overtime work has been decided upon in the coal mining industry.

Conditions in the iron and steel market are unsettled. There is much confusion over prices and quotations of various works differ considerably. Demand has increased slightly, but there are disagreements between works and customers on old contracts made at higher (gold) mark prices. Consumers ask for reductions, especially as there is strong competition and prices show a declining tendency. As a considerable decline in prices is expected before long, orders are being withheld. A probable reduction in coal prices and the introduction of the 10-hr. day in the iron and steel industry are expected to lower iron and steel prices still further, as well as competition from Belgium, France and Luxemburg, which is keenly felt.

German sheets less than 1 mm. thick, for instance, have been offered in the occupied area at 185 gold marks per ton (\$44), which is about 46 per cent below the last Steel Syndicate quotation. Bar iron has been sold at 140 gold marks per ton (\$43.30) lately. The German Iron Traders' Association has advised its members not to accept the high prices fixed by the Steel Syndicate prior to Dec. 3, but to adhere to the prices quoted on day of delivery, which are at present considerably lower. If this advice is strictly followed and the traders charge their customers correspondingly lower prices, cost of production in the engineering and allied industries should be considerably reduced.

Longer Hours of Work

An agreement on working hours in the iron and steel industry has been concluded between the masters' association and the trade unions. It is provided that factories where, prior to or during the war, working hours were less than ten, the old working day is reintroduced. On heavy work, where the men are especially subjected to heat, acids, gas, etc., work shall be in relays, so arranged that the actual working hours irrespective of intervals for meals, etc., shall not exceed a 54-hr. week. Payment in these cases is on a 10-hr. basis. For all other workers, it is agreed that the normal working week shall consist of 59 hr. In engineering and similar works the 57½-hr. week is to be the rule. The wage rate per hour is not reduced. The hardware industry in The Hagen, Velbert and Schmalkalden districts is poorly employed. Here and there a slight

improvement is noticeable but many firms are operating only three or four days a week.

Resumption of operation in the Ruhr is gradual, scarcity of material and the approach of the holidays proving difficulties. A few blast furnaces are being blown in but resumption of regular production is not expected for some time. The Gutehoffnungshütte has blown in two blast furnaces and is preparing a third. The open hearth works and the rolling mills have also been re-started. The introduction of the 10-hr. day has permitted a reduction in the number of employees. The Krupp works is slowly resuming operation. The Hoesch steel works has begun by blowing in one blast furnace. At the Phoenix works and at the Rheinische Stahlwerke only the coke ovens have been set to work. The Bochumer Verein is beginning production with 2000 men out of a total of 12,000 employed normally. Two furnaces have been blown in and the open hearth works are to begin production at an early date. Difficulty in obtaining a supply of fuel has delayed resumption. The Thyssen works seems to have made the greatest progress. Two blast furnaces have been operating for several days and production has started in the light sheet mills. The volume of new orders will decide the pace of resumption in the industry, but thus far there is no cause for optimism.

One of the chief problems of the iron works in the Ruhr is providing for an adequate supply of ore. At present the trade in ore is small. With the beginning of the occupation the Ruhr consumers refused to accept all the ore under contract, claiming *force majeur*. Some of the ore, however, was received and stored at Rotterdam or Emden. Considerable quantities are also lying at Ruhrtal and other inland ports. Dislocation of traffic has prevented moving these ores to the works, but with the reestablishment of regular railroad service stocks will be shipped into the Ruhr and should provide supplies for one to two months.

The coal industry is showing greater activity and in Gelsenkirchen 75 per cent of the miners are at work again. Negotiations are pending for a continuation of the Rhenish Westphalian Coal Syndicate under the name of Company for Distribution and Sale of Ruhr Coal. The mine owners who had declared their intention of becoming members have made their ultimate decision conditional upon 94 per cent of the old membership being retained. This condition has not been fulfilled yet, as large groups such as the Thyssen and Arenberg-Rheinstahl, which belongs to the Otto Wolff concern, have not joined the association and negotiations are continuing. At the last meeting of the mine owners it was indicated that coal prices needed to be brought to the same level as British quotations, and rough gas coal has, therefore, been reduced from 28.42 (\$6.75) to 23.50 (\$5.60) gold marks per ton. The coking plants are resuming operation, supplies are becoming regular again and the necessary stocks are accumulating. It is expected that there will probably be a shortage of coke before long, especially as the Ruhr is estimated to be working at only about 50 per cent of capacity. This is said to have been the principal reason for the formation of the new company substituting for the coal syndicate.

Minette ore is comparatively cheap, being subject to lower freight rates and a more favorable exchange. It contains only 30 to 35 per cent iron and requires about double the quantity of coke needed for reduction of Swedish ore. Preference in ore purchases between minette or Swedish ore will, therefore, be largely influenced by the supply of coke. Negotiations are under way for exchange of Lorraine ore for Ruhr coke, and there is a strong possibility that contracts will be concluded. The question of Lorraine mine owners taking a financial interest in the Ruhr has not been discussed in these negotiations. Wabana ore contracts will resume delivery next spring.

Preparing for Extended Occupation of the Ruhr

Industry is apparently preparing for an extended occupation. Not only are the large companies placing their works in the Ruhr and in unoccupied Germany under separate managements, but special organizations have been formed for the occupied area. A new association, Zweckverband der Metallindustrie der Besetzten

Gebiete (Engineering Association for the Occupied Area) has been formed at Cologne to deal with all economic questions resulting from the occupation and to assist in restarting Ruhr industry. The majority of the foundries in the district, some iron and steel works, and most of the engineering firms have already joined this association. The Rhenish Westphalian Engineering works has received numerous domestic and foreign inquiries. The new anti-syndicate legislation has, together with the changed market conditions and the separation of the works in the Ruhr, exerted a considerable moderating influence on the policy of the syndicates and several of them have changed their status. The Coal Syndicate as well as the Steel Syndicate are now on a different footing and the Wire Rope Syndicate has dissolved, effective Jan. 1.

The automobile industry is among the few reporting low unemployment figures. Dealers' stocks as well as those at factories have been reduced lately and new orders are being received to a large extent from agricultural sections. Generally unemployment is still serious and the trade unions in the iron and engineering industries report the number of members out of work at 20 per cent with 60 per cent on part time. More than half of these are in the engineering industry.

The German monthly foreign trade statistics show that exports of finished iron and engineering products increased in October to 84,544 tons against 79,783 tons during September, which is still less than 50 per cent of the 1922 monthly average. Of machinery, 27,795 tons were exported, compared with 20,692 tons in September.

A new company, the Preussische Bergwerks und Hütten Aktiengesellschaft, has been established by the Prussian state. The company is to take over all the mines and iron works owned by the State of Prussia. The board of supervision (Aufsichtsrat) is formed of 12 representatives of the Government, one representative of every party in the Prussian Diet and three representatives of industry. The first works taken over by the new company is the Oberharzer Berg und Hüttenwerk. The new company was established to free the works from politics at the same time preserving the connection with each other and excluding private capital.

The Deutz Engineering Co. and the Hamburg shipyard and engineering firm of Janssen & Schmilinski have concluded a merger. Janssen & Schmilinski are licensed to install Deutz motors in ships.

According to the present German constitution the

Reichswirtschaftsrat (Federal Economic Council) represents the economic life of the country. The committee of the Federal Economic Council has now worked out a plan for the definite constitution of the council which will probably be accepted by the Government and the Reichstag.

The council would be closely connected with, and partly be elected by district chambers (Bezirkswirtschaftsräte). These would consist of three groups, the representatives of the authorities, of the trade organizations, and of other economic organizations. The first two groups are to be equal in number, and 50 per cent of the members are to be delegated by the employers and 50 per cent by the employees. While the first two groups would represent trade, industry, commerce and agriculture, group three would be formed by the representatives of the municipalities, the cooperative societies and other public bodies. The exact number of representatives allotted to each group would be fixed by the statute and any organization could recall its representatives at any time.

The Bezirkswirtschaftsrat, according to the plan, would be consulted by the authorities on all economic questions that affect the district. It could make proposals and applications to the authorities in all economic and social matters, and to a limited extent would be authorized to manage and supervise. Personal expenses of the members would be borne by the different organizations and general expenditures by the district. The plan calls for consultation by the Government with the Reichswirtschaftsrat on all economic and social questions affecting the whole country, and would authorize the council to draft bills and ask the Government to introduce them in the Reichstag.

All economic and social bills would be placed before the Reichswirtschaftsrat sufficiently early to give this body time for consideration of them and to voice its opinion in the legislative bodies. Any assistance required by the central authorities would be given by the Reichswirtschaftsrat. In all cases where representatives of trade and industry are to serve on an economic or social managing authority they would be delegated by the council. The Federal Economic Council has at present 326 members; it is intended to reduce this membership to about 160. It would be constituted somewhat in the same manner as the Bezirkswirtschaftsräte, but whereas the three groups in the latter represent different interests in the districts, the former would be representative of the various parts of the country.

LONGER HOURS IN GERMANY

Some Progress in Industry, but Five Millions Are Unemployed

In THE IRON AGE of Nov. 15 Dr. Richard Moldenke, who had made an extended European trip including a considerable stay in Germany, wrote in detail of the way in which Germany must work out her industrial and commercial problems. He referred particularly to the career of Dr. Heinrich Brauns, the German Minister of Labor, and of what Dr. Brauns had accomplished, having won the confidence of both the workmen's and the manufacturers' organizations. In a letter written to Dr. Moldenke from Berlin on Dec. 19, Dr. Brauns comments on THE IRON AGE article and on the more recent developments in the situation in Germany, both social and industrial. In part he writes as follows:

"You have emphasized the fact that I enjoy the confidence of employer and employee alike. I am free to admit that during the three and a half years of my activities as Minister of Labor of Germany it has been a keen satisfaction to me to have been able always to bring about satisfactory adjustments between capital and labor in important crises. There was never a time, however, when the finding of a common ground was more difficult than at present. To tax a collapsed industry to the utmost; to expect impoverished and un-

dernourished workers to accept a prolongation of their hours of labor by two hours—in the case of miners, of one hour—without being able to give them wages commensurate with high food prices, puts a burden of responsibility upon the conscience of a German cabinet member which is almost unbearable.

"And yet the very responsibilities resting upon a government compel the exaction of such measures in cold blood, as the only way by which an ailing nation may recover and our national economy may be sound again. In the meantime we have succeeded—through great reductions in our already niggardly governmental expenditures—in stabilizing our currency; our miners work an hour a day longer; our blast furnace operatives two hours longer; and a considerable deflation in selling prices can now be recorded. We are still far away from peace-time prices, even though wages and salaries today are still but fractions of those of pre-war times. May God grant that the path of trial for our nation be soon directed into quiet and smoother channels. Since your departure from Germany, the social conditions have become much worse. We have today (Dec. 19) over 5,000,000 men out of work, and hundreds of thousands of people only kept from death by starvation through the intervention of private charity. I ask you not to cease giving the true condition of Germany every publicity, so that the charitable work carried on in the United States may help relieve private German distress and be welcomed by us as a work of love."

AN INTERNATIONAL TEST BAR

A. F. A. Committee Lays Plans for Its Work in Gray Iron Lines

The gray iron test bar committee of the American Foundrymen's Association had a meeting in Detroit on Dec. 15 to consider the methods that will be followed in the committee's investigations. There were present H. B. Swan, Cadillac Motor Car Co., Detroit; R. S. MacPherran, Allis-Chalmers Mfg. Co., Milwaukee; Willard Rother, Buffalo Foundry & Machine Co., Buffalo; J. K. Stoddard, Detroit Testing Laboratory, Detroit; E. J. Lowry, Hickman, Williams & Co., Chicago.

As visiting members of the American Society for Testing Materials A-4 committee on gray iron, Walter Wood, Dr. Richard Moldenke and H. E. Diller also took part in the meeting. Dr. Moldenke and Mr. Wood had attended the International Foundry Congress in Paris last summer and they gave the test bar committee a report of their conferences there with foundrymen from other countries, at which the question of an arbitration test bar was discussed. This was quite fully reported in *THE IRON AGE* of Sept. 27 and Oct. 4.

On the international test bar committee are representatives from eight countries—the United States, England, France, Spain, Italy, Belgium, Switzerland and Czechoslovakia. Ramas of France is chairman and E. Ronceray of Paris is the secretary. H. B. Swan is the American member.

It was decided at the Detroit meeting that the lines of inquiry preliminary to the selection of an international arbitration bar include (1) the relation of different sizes and shapes of test bars to be used in determining the quality of the iron in the ladle, and (2) the relation of the test bar to the casting.

The committee recommended that preference be

given the transverse test in the investigations that are to be made. It was decided also to investigate a shrinkage chill test bar invented by Mr. Lowry.

The procedure which the committee recommends to foundries participating in its work is stated as follows:

Experimental work shall be done on round test bars. The diameters of the test bars to be considered shall be 1.2, 1.3, 1.4 and 1.5 in. The bars shall be cast on end, one to a mold, 21 in. long and shall be tested on 18 in. centers. The design of the bar shall be similar to the present A.S.T.M. bar with the alteration in dimensions noted above. The molds shall be either made of dry sand or cores. The test bars shall not be tumbled or machined, and in case of shipment over railroads to a point where they may be tested, the test bars shall be packed in sawdust or some similar material.

There shall be at least twelve bars of each diameter cast from a heat and these bars shall be cast from the same ladle. Six of the bars shall be tested by the maker and the remaining six bars shall be sent to the committee, care of E. J. Lowry, secretary, Chicago, for supplementary tests. The analyses of the sets of test bars shall be sent to the committee along with the results of the individual foundry strength tests. The analysis should cover carbons, silicon, sulphur, phosphorus and manganese.

The test bars shall be numbered from 1 to 12 and in such a way that their identity may not be destroyed, i.e., such as the heat number and maker's mark.

In order to effect knowledge of the English method of testing the following shall be pursued: Test bars, 12 in number, molded singly on end, in dry sand or core molds shall be made by individual foundries. These bars shall have the following dimensions: 0.875 in.-diam., 15 in. long, 1.2 in.-diam., 21 in. long, and 2.2 in.-diam., 21 in. long.

These bars shall be tested in accordance with the plan set forth above. The 0.875-in. bar shall represent castings up to $\frac{3}{4}$ -in. section; the 1.2-in. bar, up to 2-in. section castings and the 2.2-in. bar, above 2-in. section castings. These bars shall be tested on supports 12 in. and 18 in. apart.

Factors shall be determined to correlate these various diameter test bars to the 1.2 in. diameter strength.

being distributed by the companies which do this class of work. The new list became effective Jan. 1.

Important Changes in Machine Building Industry of Germany Expected

WASHINGTON, Jan. 8.—Sweeping changes are looked for, especially in the machine building industry of Germany, as the result of a recent decree by the chancellor providing for the regulation of cartels and the curbing of price fixing activities of German manufacturers, according to a report received by the Department of Commerce from Trade Commissioner Arthur Grey, Berlin. The trade commissioner pointed out that the cartel system for many years furnished the groundwork of both the production and export selling efficiency in the machine building industry. Because of this he predicts that the decree regulating the cartels will be particularly marked in its effects in the machine building industry. He explained that the extensive export trade in machinery developed before the war was acquired in a large measure through the collective efforts of machine dealers in Germany operating through the cartels.

The trade commissioner said it would be only logical to count upon some such cooperation when the time arrives for these manufacturers to attempt to revive their export business. At the present moment, he stated, owing to their inability to sell abroad because of higher than world market prices, the question of reconquering foreign markets lacks the urgency of a practical situation, but there can be no doubt that with the re-establishment of conditions approaching normal the inhibition enforceable through the new law will be found burdensome.

The decree became effective Nov. 20 of last year and was issued by the chancellor under the empowering act which gives him dictatorial power. It is stated that the decree in many respects resembles the Sherman law and terminates the license enjoyed so long by the German cartels and other combinations to control trade at home and abroad at the will of the majority of the constituent members.

New Extras on Flanged and Dished Heads

Plate mills which specialize in flanged and dished heads have published a new card of extras, which constitute a considerable advance. The advances are graduated, being relatively higher on the small than on the large sizes. For example, flanged heads 12 in. and under 17 in. of 3/16-in. plate, which formerly took an extra of \$1, now take an extra of \$3.90, while heads 53 in. and under 57 in. of 3/16-in. plate, formerly \$4, are now \$5.50 extra. On dished heads the advances correspond. A dished head of 12 in. outside diameter, with maximum depth of dish 1 1/8 in. of 3/16-in. plate, formerly \$1.50 extra, now is \$3.

Printed cards containing the full list of extras are

DECEMBER STEEL OUTPUT

Production Rate 6011 Tons a Day Below That of November—Year's Ingot Total 43,227,000 Tons

The output of steel ingots in the United States in December declined less than had been claimed. The falling off was only 270,040 gross tons from November, as compared with a decline of 434,162 tons in November from the October total. The decline in daily rate was only 6011 tons in December, as compared with a decline of 11,644 tons per day in November from the previous month. The December falling off in the daily rate was about 5 per cent against a decline in November of 9 per cent.

The statistics of the American Iron and Steel Institute indicate a daily rate last month of 113,751 tons, as compared with a daily average of 119,762 tons in November. The December output of companies which made 95.35 per cent of the country's total in 1922 was 2,711,529 tons which, assuming that the 4.65 per cent not reporting produced the same percentage of the total as in 1922, points to a total December output of 2,843,764 tons. This brings the year's total ingot output to 43,226,955 tons.

The table below gives the production by months for 1923 of the different kinds of steel, together with estimated daily rate for all companies. Following it is a table showing the production by months in 1922:

Monthly Production of Steel Ingots, January, 1923, to October, 1923, Reported for 1923 by Companies Which Made 95.35 Per Cent of the Steel Ingot Production in 1922

Months 1923	Open- hearth	Bessemer	Other	All Companies	Approximate Daily Production	
					Calculated Monthly Production	All Companies, Gross Tons
Jan. . .	2,906,892	728,270	9,467	3,822,369	141,569	
Feb. . .	2,613,564	669,903	10,797	3,454,918	143,955	
March . .	3,046,309	799,525	12,841	4,046,854	149,883	
April . .	2,974,579	772,485	13,933	3,944,412	157,776	
May . .	3,136,558	847,418	16,719	4,195,800	155,400	
June . .	2,821,239	737,845	15,483	3,748,890	144,188	
July . .	2,638,449	680,884	11,496	3,514,241	140,570	
Aug. . .	2,796,370	701,059	9,326	3,677,771	136,214	
Sept. . .	2,539,653*	613,709	8,602	3,316,166*	132,647*	
Oct. . .	2,724,371	649,452	9,163	3,547,966	131,406	
Nov. . .	2,343,368	616,335	9,309	3,113,804	119,762	
Dec. . .	2,130,613	570,004	10,912	2,843,764	113,751	
Total. .	32,691,965	8,386,889	138,048	43,226,955	138,993	

*Revised.

Monthly Production of Steel Ingots, January, 1922, to December, 1922, Reported by Companies Which Made 84.15 Per Cent of the Steel Ingot Production in 1922

Months 1922	Open- hearth	Bessemer	Other	All Companies	Approximate Daily Production	
					Calculated Monthly Production	All Companies, Gross Tons
Jan. . .	1,260,809	331,851	822	1,891,857	72,764	
Feb. . .	1,395,835	348,571	616	2,071,772	86,324	
March . .	1,918,570	451,386	795	2,814,667	104,247	
April . .	1,997,465	445,939	1,109	2,902,240	116,090	
May . .	2,214,774	494,893	1,474	3,218,794	119,215	
June . .	2,143,708	487,851	2,918	3,127,775	120,299	
July . .	2,020,572	464,047	2,485	2,952,806	118,112	
Aug. . .	1,807,310	404,379	2,893	2,629,256	97,380	
Sept. . .	1,911,147	460,127	2,505	2,818,261	108,395	
Oct. . .	2,352,207	518,010	2,198	3,410,265	131,164	
Nov. . .	2,360,903	525,945	2,449	3,430,309	131,935	
Dec. . .	2,241,104	536,214	2,572	3,300,416	132,017	
Total. .	23,624,404	5,469,213	22,836	34,568,418	111,511	

Moline Plow Co.'s New Policy

According to an announcement made by George N. Peek, president Moline Plow Co., Moline, Ill., his organization will discontinue the manufacture of harvesters and tractors. He said in part: "We will discontinue the manufacture of harvesters at Poughkeepsie, N. Y., which has long been unprofitable. We will discontinue the manufacture of tractors at Rock Island, which likewise has been unprofitable. Contracts have been made with Samuel L. Winternitz and Michael Tauber & Co., both of Chicago, for the sale of such equipment as we care to dispose of at both of these places. Contracts have been entered into for

the supply of repairs with the Standard Motor Parts Co. of Detroit. We are now figuring on manufacturing mowers and rakes in our Stoughton, Wis., plant. The manufacture of our tillage line in the plow factory at Moline, wagons, spreaders and hay tools in Stoughton, and drills and other seeding machines in Minneapolis will be continued. Business in these lines is good—better than it has been for a number of years—and the success of the company upon these retained lines, sold under the Moline plan, is assured. The plant property at Poughkeepsie will be sold."

Hearings on Johnson Immigration Bill at Washington

WASHINGTON, Jan. 8.—Declaring that the manufacturer had a far greater stake in the quality of the future citizen than in the quantity of present labor, the Committee on Immigration of the National Association of Manufacturers, through its counsel, James A. Emery, last Friday presented its views before the House Committee on Immigration which is holding hearings on the bill of Chairman Johnson of the House committee which provides a 2 per cent immigration quota based on the 1890 census of alien residents, intended to replace the existing 3 per cent law based on the 1910 quota.

Mr. Emery told the House committee that the committee for which he spoke and that all whom it represented were and always had been equally opposed to unrestricted immigration or to substantial prohibition of all immigration under the guise of restriction. The committee, he declared, approves the proposal for administrative features of the bill, supported by Secretary of Labor Davis and therefore the Administration, for examination by American consular officers of aliens intending to emigrate to the United States.

While there is strong support for the Johnson bill, it also has met with considerable opposition, particularly from the Italian Government which protests that the measure, if enacted, would so reduce immigration from Italy that it would be discriminatory against that country. Doubt exists that Congress will be able to enact any broad immigration legislation at this session. It is rather the view that instead it will enact a joint resolution continuing the present law, although it may pass certain administrative features such as that providing for selection abroad through consuls.

Strike in Connellsville Region Not Believed Probable

UNIONTOWN, PA., Jan. 7.—Stiffening in price for both coal and coke has been noted in the Connellsville region market during the past week or two with indications that prices for spot sales after the first of the year will range around \$4.50 for furnace coke, \$5.50 for foundry coke; \$1.90 and \$2 for steam coal and around \$2.25 for by-product coal. Some contracting has been done in both coal and coke for the first quarter, although contracts are not so numerous as in years past, there being a tendency on the part of operators to refrain from contracts, rather holding to the spot market.

Conditions in the coke region as far as labor are concerned show no evidences of any strike trend during the April 1 period. During the past week or so a number of emissaries from union fields have been in the region investigating conditions in the local field, but there has been no evidence that coke region workers will be influenced by developments in the union region.

Production of coke for the week ending Dec. 22 was 195,420 tons, an increase of 12,360 tons over the preceding week. For the same week last year the production was 204,530 tons. The increase during the week immediately preceding Christmas was due to increased operations at various plants with a desire of the owners to give the workers a full time operation and pay for the Christmas season.

DECEMBER IRON OUTPUT

Decline from November 2251 Tons Per Day—Rate Lowest of the Year

Nine Furnaces Blown and Nine Down or Banked
—Year's Output 40,059,308 Tons

Official returns for the December output of blast furnaces warrant practically no change in the estimate published in THE IRON AGE, Jan. 3. The decline in daily rate was 2251 tons per day at 94,225 tons per day for December as compared with 96,476 tons for November. The December daily rate was the lowest for the year. Instead of there being a gain of one furnace for December, the net change was none, according to the revised data.

Production of coke and anthracite pig iron for the 31 days of December amounted to 2,920,982 gross tons or 94,225 tons per day as compared with 2,894,295 tons or 96,476 tons per day for the 30 days in November. The total for the year is therefore 40,059,308 tons, comparing with 26,880,383 tons in 1922, making the 1923 output the largest on record. There were 9 furnaces blown in and 9 blown out or banked during December, leaving the total number of furnaces in blast on Jan. 1 at 231, the same as on Dec. 1. The capacity of the 231 furnaces in blast on Jan. 1 is estimated at 94,265 tons per day as compared with 94,345 tons per day for the same number of furnaces operating on Dec. 1.

The output of ferromanganese in December was 18,069 tons with the spiegeleisen production 10,124 tons.

Daily Rate of Production

The daily rate of production of coke and anthracite pig iron by months, from December, 1922, is as follows:

Daily Rate of Pig Iron Production by Months—Gross Tons			
	Steel Works	Merchant	Total
December, 1922.....	75,179	24,398	99,577
January, 1923.....	79,991	24,190	104,181
February.....	80,684	26,251	106,935
March.....	87,881	25,792	113,673
April.....	90,145	28,179	118,324
May.....	96,029	28,735	124,764
June.....	90,907	31,641	122,548
July.....	88,798	29,858	118,656
August.....	86,479	24,795	111,274
September.....	78,799	25,385	104,184
October.....	77,255	24,331	101,586
November.....	72,352	24,124	96,476
December.....	69,921	24,304	94,225

The figures for daily average production, beginning with January, 1917, are as follows:

Daily Average Production of Coke and Anthracite Pig Iron in the United States by Months Since Jan. 1, 1917—Gross Tons						
1917	1918	1919	1920	1921	1922	1923
Jan. 101,643	77,799	106,525	97,264	77,945	53,063	104,181
Feb. 94,473	82,835	105,066	102,720	69,187	58,214	106,935
Mar. 104,882	103,648	99,685	108,900	51,468	65,675	113,673
Apr. 111,165	109,607	82,607	91,327	39,768	69,070	118,324
May 110,238	111,175	68,002	96,312	39,394	74,409	124,764
June 109,002	110,793	70,495	101,451	35,494	78,701	122,280
July 107,820	110,354	78,340	98,931	27,889	77,592	118,656
Aug. 104,772	109,341	88,496	101,529	30,780	58,586	111,274
Sept. 104,465	113,942	82,932	104,310	32,850	67,791	104,184
Oct. 106,550	112,482	60,115	106,212	40,215	85,092	101,586
Nov. 106,859	111,802	79,745	97,830	47,183	94,990	96,476
Dec. 92,997	110,762	84,944	87,222	53,196	99,577	94,225
Year 104,619	105,496	83,789	99,492	45,325	73,645	109,713

Among the furnaces blown in during December were the following: Harriet Y furnace in the Buffalo district and the furnace of the Witherbee-Sherman Co. in New York, which was banked; one furnace at the Bethlehem plant of the Bethlehem Steel Corporation in the Lehigh Valley; one furnace of the Cambria plant of the Bethlehem Steel Corporation in Bethlehem, Pa.; Grace furnace of the Brier Hill plant of the Youngstown Sheet & Tube Co. and the Mattie furnace in the

Mahoning Valley; one furnace of the Colorado Fuel & Iron Co. in Colorado; one City furnace of the Sloss-Sheffield Steel & Iron Co. and No. 2 Vanderbilt furnace of the Woodward Iron Co. in Alabama.

Among the furnaces blown out or banked during December were the following: The Delaware River furnace in the Schuylkill Valley; one Monessen furnace of the Pittsburgh Steel Co. in the Pittsburgh district; the Earlston and Perry furnaces in western Pennsylvania; the Buena Vista furnace of the Allegheny Ore & Iron Co. in Virginia; No. 2 Haselton furnace of the Republic Iron & Steel Co. in the Mahoning Valley; No. 3 furnace of the National Tube Co. in northern Ohio; No. 3 Woodward furnace of the Woodward Iron Co. in Alabama and the LaFollette furnace in Tennessee.

Output by Districts

The accompanying table gives the production of all coke and anthracite furnaces for December and the three months preceding:

Pig Iron Production by Districts, Gross Tons				
	Dec. (31 days)	Nov. (30 days)	Oct. (31 days)	Sept. (30 days)
New York	204,157	193,621	219,857	208,737
New Jersey	19,272	18,509	19,473	18,293
Lehigh Valley	83,332	82,748	81,614	73,945
Schuylkill Valley	71,838	73,069	91,457	88,699
Lower Susquehanna and Lehigh Valley	64,002	63,720	60,568	56,531
Pittsburgh district	595,317	595,876	653,970	659,963
Shenango Valley	97,527	99,228	117,656	127,781
Western Pa.	109,419	116,910	157,649	157,960
Maryland, Virginia and Kentucky	61,470	68,787	60,278	55,581
Wheeling district	140,659	136,349	141,593	147,771
Mahoning Valley	293,043	280,667	279,834	286,558
Central and Northern Ohio	266,128	265,198	282,009	273,885
Southern Ohio	44,708	24,619	36,083	37,416
Illinois and Indiana	522,994	535,362	595,457	587,323
Mich., Minn., Mo., Wis. and Colo.	124,993	111,291	117,128	113,460
Alabama	214,013	215,613	213,105	213,083
Tennessee	8,110	12,676	21,427	18,526
Total	2,920,982	2,894,295	3,149,158	3,125,512

Capacities in Blast Jan. 1

The following table shows the number of furnaces in blast Jan. 1 in the different districts and their capacity, also the number and daily capacity in gross tons of furnaces in blast Dec. 1:

Location of Furnaces	Total Stacks	Jan. 1		Dec. 1—Capacity per Day
		In Blast	Capacity per Day	
<i>New York:</i>				
Buffalo	22	16	6,540	15 5,965
Other New York	5	2	400	1 130
New Jersey	4	2	610	2 615
<i>Pennsylvania:</i>				
Lehigh Valley	16	7	2,900	6 2,510
Spiegeleisen	2	2	245	2 250
Schuylkill Valley	15	6	2,055	7 2,370
Lower Susquehanna	9	6	1,550	5 1,610
Ferromanganese	1	0	...	1 70
Lebanon Valley	6	2	375	2 365
Ferromanganese	2	1	75	1 80
Pittsburgh District	55	41	18,740	43 19,335
Ferro and Spiegel	4	4	435	3 505
Shenango Valley	19	8	3,170	8 3,300
Western Pennsylvania	25	11	3,480	12 3,660
Ferro and spiegel	2	0	...	0 0
Maryland	5	3	1,410	3 1,045
Ferromanganese	1	1	85	1 80
Wheeling District	15	10	4,530	10 4,545
<i>Ohio:</i>				
Mahoning Valley	28	20	9,475	19 9,355
Central and Northern	26	16	8,380	17 8,555
Southern	16	5	1,430	5 1,190
Illinois and Ind.	42	31	16,885	31 17,010
Mich., Wis. and Minn.	12	8	3,290	8 3,340
Colorado and Missour.	6	2	825	1 400
<i>The South:</i>				
Virginia	18	3	400	4 565
Kentucky	7	1	300	1 305
Alabama	39	22	6,500	21 6,805
Ferromanganese	1	0	...	0 0
Tenn., Ga. and Texas	16	1	180	2 365
Total	418	231	94,265	231 94,345

Production of Steel Companies—Gross Tons

Returns from all furnaces of the United States Steel Corporation and the various independent steel companies, as well as from merchant furnaces producing ferromanganese and spiegeleisen, show the fore-

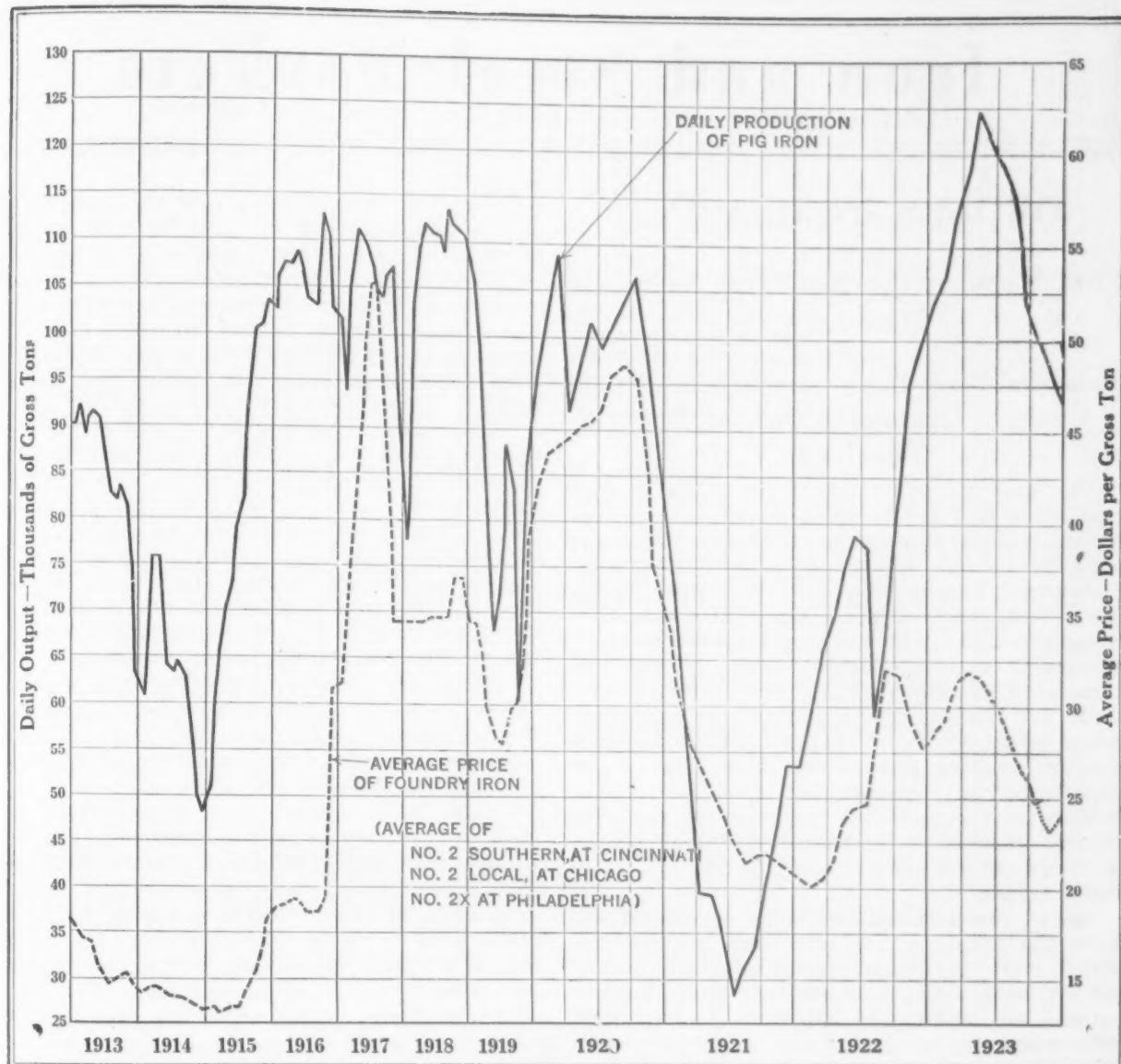


Diagram of Pig Iron Production and Price

going totals of steel making iron, month by month, together with ferromanganese and spiegeleisen. These last, while stated separately, are also included in the columns of "total production."

No. 2 foundry pig iron at Cincinnati, local No. 2 foundry iron at furnaces in Chicago, and No. 2X at Philadelphia. They are based on the weekly quotations of THE IRON AGE.

Production of Steel Companies—Gross Tons

	Total Production		1922		1923	
	1922	1923	Fe-Mn	Spiegel	Fe-Mn	Spiegel
Jan.	1,306,045	2,479,727	6,874	1,230	19,358	12,056
Feb.	1,311,170	2,259,154	3,610	4,930	21,282	3,657
Mar.	1,629,982	2,724,305	11,600	2,095	20,730	13,832
Apr.	1,707,902	2,704,360	14,998	4,211	20,808	7,440
May	1,879,180	2,976,892	15,432	4,902	19,568	9,533
June	1,876,033	2,727,208	18,273	4,817	19,717	18,289
6 mos.	9,710,312	15,871,646	70,787	22,185	121,564	64,807
July	1,931,138	2,752,738	18,873	7,176	26,493	12,876
Aug.	1,415,832	2,680,851	11,402	7,925	22,045	5,586
Sept.	1,615,696	2,363,967	10,681	4,235	23,206	4,478
Oct.	2,047,873	2,394,922	9,193	12,283	20,015	15,931
Nov.	2,165,295	2,170,567	13,232	4,192	14,839	16,783
Dec.	2,330,545	2,167,563	17,007	10,591	18,069	10,124
Year.	21,216,691	30,402,254	151,175	68,587	246,231	130,585

Year. 21,216,691 30,402,254 151,175 68,587 246,231 130,585

Production of Coke and Anthracite Pig Iron in the United States by Months, Beginning Jan. 1, 1919—Gross Tons

	1919	1920	1921	1922	1923
Jan.	3,302,260	3,015,181	2,416,292	1,644,951	3,229,604
Feb.	2,940,168	2,978,879	1,937,257	1,629,991	2,994,187
Mar.	3,090,243	3,375,907	1,595,522	2,035,920	3,523,868
Apr.	2,478,218	2,739,797	1,193,041	2,072,114	3,549,736
May	2,108,056	2,985,682	1,221,221	2,306,679	3,867,694
June	2,114,863	3,043,540	1,064,833	2,361,028	3,676,445
1/2 year . . .	16,033,808	18,138,986	9,428,166	12,050,683	20,841,534
July	2,428,541	3,067,043	864,555	2,405,365	3,678,334
Aug.	2,743,388	3,147,402	954,193	1,816,170	3,449,493
Sept.	2,487,965	3,129,323	985,529	2,033,720	3,125,512
Oct.	1,863,558	3,292,597	1,246,676	2,637,844	3,149,158
Nov.	2,392,350	2,934,908	1,415,481	2,849,703	2,894,295
Dec.	2,633,268	2,703,855	1,649,086	3,086,898	2,920,982
Year*	30,582,878	36,414,114	16,543,086	26,880,383	40,059,308

*These totals do not include charcoal pig iron. The 1922 production of this iron was 224,731 tons.

Production and Price Chart

The fluctuations in pig iron production from 1913 to the present time are shown in the accompanying chart. The figures represented by the heavy lines are those of the daily average production, by months, of coke and anthracite iron. The dotted curve on the chart represents monthly average prices of Southern

The Standing Committee on Woven Wire Fence at a meeting last Friday at the Department of Commerce, Washington, decided to let the present plan of woven wire simplification, as adopted by 90 per cent of the industry on Sept. 1 of last year, continue in force until the next meeting, which will be held in July.

Iron and Steel Markets

ORDERS INCREASING

First Week of the New Year Generally More Active

Structural Work Leads—Manufacturing Consumers Continue to Buy for Early Shipment

Business has been put on the books of steel companies in the first week of the new year at a rate tending to confirm earlier predictions of good rolling mill operations in the first quarter. Statements coming from the Pittsburgh market are rather more restrained than those from Chicago, Cleveland and Philadelphia, but there is agreement as to the larger volume of specifications after the completion of inventories.

It was not expected that any new major tendency would develop in the first week in January, and on existing price levels both jobbers and manufacturing consumers of steel are plainly holding to the policy of ordering for the near future. Meanwhile the number of orders coming in shows the low state of many factory and warehouse stocks.

In all districts mill schedules are increasing after the holidays, and plate and bar rollings, which were particularly unsatisfactory in December, have shown improvement. But plate mill outputs will continue to fall below those of early 1923 unless very considerable increases are seen in railroad car orders.

Construction work still promises to come nearer than any other important line to equaling its record of the first half of 1923 as a feeder of the steel mills. Including 13,000 tons of fabricated steel work for the Ford Motor Co., covering two factory buildings at Detroit and three assembly buildings in the South, bookings in all exceeded 31,000 tons. About two-thirds was for industrial plants. Private enterprises represented over one-half of the 51,000 tons of fresh inquiries, but few were for factories. One-fourth was for public work and one-fifth for the railroads.

An inquiry from the Pennsylvania Railroad for 3000 all-steel car bodies, early expectation of buying by the New York Central of 10,000 cars, and inquiries covering car rebuilding proposals are among the week's developments in the railroad equipment field. At Chicago buying of track supplies has been heavy. One order was for 6000 tons of tie plates, another for 5000 tons of angle bars, and an inquiry is out for 10,000 tons of tie plates. Railroads in that district are ordering forward their rails and track supplies on a large scale in anticipation of spring track work.

Two lake boats are now assured a Detroit shipyard, each requiring 5000 tons of steel.

In Northern Ohio semi-finished steel has become more active, but with no concessions from the \$42.50 price the mills have held for several months on sheet bars. Sales of several thousand tons of sheet bars were made, and there is new inquiry for billets.

Steel ingot production in December was closely in line with predictions, bringing the total for 1923 to 43,227,000 tons, as compared with our estimate of 43,250,000 tons. December showed a falling off of 5 per cent from the daily rate of November, which was 9 per cent below that of October. From the peak rate of 157,776 tons a day in April to 113,751 tons a day in December the decline was 28 per cent.

A lake furnace has sold 10,000 tons of pig iron, including 6000 tons of foundry and malleable for automobile work, and sales at St. Louis include 9500 tons of basic and 2500 tons of foundry, but transactions throughout the country as a rule have been limited in number and tonnage. Resale iron in the Buffalo and Philadelphia districts is causing some uncertainty as to prices, but for the most part recent quotations are maintained and in some centers lower prices lately named have disappeared.

The widely circulated report of basic pig iron buying by the Steel Corporation was unfounded, but the Carnegie Steel Co. took 5000 tons of heavy melting steel scrap at \$20, an advance of 50 cents.

Japan has made a promising start in buying for 1924, having placed 10,000 tons of 60-lb. and 75-lb. rails in this country, together with 400 tons of splice bars; also 1000 tons of pipe for the Tokyo Gas Co. and 12,500 boxes of tin plate.

A slight advance in *THE IRON AGE* pig iron composite price brings it to \$21.96 from the \$21.88 level of the five previous weeks. It is now 15.4 per cent below the \$25.96 of one year ago.

Finished steel is 13.5 per cent higher than the 2.446c. per lb. of one year ago, *THE IRON AGE* finished steel composite price having stood at 2.775c. for 24 weeks without change and having varied in the past 8 months by less than 1/2 per cent.

Pittsburgh

Buying of Steel in Moderate Volume, with Prices Firmly Held

PITTSBURGH, Jan. 8.—Some of the holiday enthusiasm appears to have gone out of the steel situation, which, to use a homely comparison, has some of the languor of a man who has just finished a good meal. Buyers seem to have pretty generally provided against their requirements for the next 60 days and now appear content to let matters drift pending more light on what the new year holds in store. Demand from the automotive industry is noticeably lighter and the more common explanation is that the manufacturers will not have very definite ideas as to production programs until after the automobile shows in New York and Chicago.

Optimistic predictions as to the December bookings of sheets by independent manufacturers have not been fulfilled. While it was a good month in the matter of sales, it fell short of setting a new high record by about 50,000 tons. Pipe business has improved with the opening of the year and there seems to be a steady increase in the volume of business in wire products. Utterances as to plate business still are conservative. In all finished lines, however, the mills are better sup-

A Comparison of Prices

Advances Over the Previous Week in Heavy Type, Declines in Italics
At date, one week, one month, and one year previous

For Early Delivery

	Jan. 8, 1924	Dec. 31, 1923	Dec. 11, 1923	Jan. 9, 1923
Pig Iron, Per Gross Ton:				
No. 2X, Philadelphia†	\$24.26	\$24.26	\$24.26	\$29.76
No. 2, Valley furnace†	22.00	22.00	22.00	27.00
No. 2, Southern, Cin'ti†	25.05	25.05	25.05	27.05
No. 2 Birmingham, Ala.†	21.00	21.00	21.00	23.00
No. 2 foundry, Chicago*	23.50	23.00	23.00	29.00
Basic, del'd, eastern Pa.	23.25	23.25	23.25	28.00
Basic, Valley furnace	21.00	21.00	21.00	26.00
Valley Bessemer, del. P'gh.	24.76	24.76	24.76	29.27
Malleable, Chicago*	23.50	23.00	23.00	29.00
Malleable, Valley	22.00	22.00	20.00	27.00
Gray forge, Pittsburgh	23.26	23.26	23.26	28.27
L. S. charcoal, Chicago	29.15	29.15	29.15	33.15
Ferromanganese, furnace	109.00	109.00	107.50	102.50

Rails, Billets, Etc., Per Gross Ton:

O-h. rails, heavy, at mill	\$43.00	\$43.00	\$43.00	\$43.00
Bess. billets, Pittsburgh	40.00	40.00	40.00	36.50
O-h. billets, Pittsburgh	40.00	40.00	40.00	37.50
O-h. sheet bars, P'gh.	42.50	42.50	42.50	37.50
Forging billets, base, P'gh.	45.00	45.00	45.00	43.00
O-h. billets, Phila.	45.17	45.17	45.17	42.17
Wire rods, Pittsburgh	51.00	51.00	51.00	47.50
Cents	Cents	Cents	Cents	
Skelp, gr. steel, P'gh, lb.	2.35	2.35	2.35	2.00
Light rails at mill	2.25	2.25	2.25	2.15

Finished Iron and Steel,

Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Iron bars, Philadelphia	2.62	2.62	2.67	2.325
Iron bars, Chicago	2.40	2.40	2.40	2.35
Steel bars, Pittsburgh	2.40	2.40	2.40	2.00
Steel bars, Chicago	2.50	2.50	2.50	2.10
Steel bars, New York	2.74	2.74	2.74	2.34
Tank plates, Pittsburgh	2.50	2.50	2.50	2.00
Tank plates, Chicago	2.60	2.60	2.60	2.30
Tank plates, New York	2.74	2.74	2.74	2.34
Beams, Pittsburgh	2.50	2.50	2.50	2.00
Beams, Chicago	2.60	2.60	2.60	2.20
Beams, New York	2.74	2.74	2.74	2.34
Steel hoops, Pittsburgh	3.00	3.00	3.00	2.75

*The average switching charge for delivery to foundries in the Chicago district is 61c. per ton.

†Silicon, 1.75 to 2.25. ‡Silicon, 2.25 to 2.75.

The prices in the above table are for domestic delivery and do not necessarily apply to export business.

Sheets, Nails and Wire,	Jan. 8, 1924	Dec. 31, 1923	Dec. 11, 1923	Jan. 9, 1923
<i>Per Lb. to Large Buyers:</i>				
Sheets, black, No. 28, P'gh.	3.75	3.75	3.75	3.35
Sheets, galv., No. 28, P'gh.	4.90	4.90	4.90	4.35
Sheets, blue an'Td, 9 & 10	3.00	3.00	3.00	2.50
Wire nails, Pittsburgh	3.00	3.00	3.00	2.70
Plain wire, Pittsburgh	2.75	2.75	2.75	2.45
Barbed wire, galv., P'gh.	3.80	3.80	3.80	3.35
Tin plate, 100-lb. box, P'gh.	\$5.50	\$5.50	\$5.50	\$4.75

Old Material, Per Gross Ton:

Carwheels, Chicago	\$20.00	\$20.00	\$19.50	\$27.00
Carwheels, Philadelphia	20.00	19.50	19.50	21.00
Heavy steel scrap, P'gh.	20.00	19.50	18.50	22.00
Heavy steel scrap, Phila.	17.50	17.50	16.50	19.00
Heavy steel scrap, Ch'go.	16.75	16.75	16.00	19.00
No. 1 cast, Pittsburgh	21.00	21.00	19.50	23.00
No. 1 cast, Philadelphia	20.50	20.50	20.00	23.00
No. 1 cast, Ch'go (net ton)	20.00	20.00	19.50	21.50
No. 1 RR. wrot, Phila.	20.00	19.00	18.50	21.50
No. 1 RR. wrot. Ch'go (net)	15.00	15.00	15.00	18.00

Coke, Connellsville, Per Net Ton at Oven:

Furnace coke, prompt	\$3.75	\$3.75	\$4.00	\$7.75
Foundry coke, prompt	4.75	4.75	4.75	8.50

Metals,

Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Lake copper, New York	19.12 1/2	18.25	18.25	14.75
Electrolytic copper, refinery	12.62 1/2	12.75	12.87 1/2	14.50
Zinc, St. Louis	6.42 1/2	6.27 1/2	6.25	7.00
Zinc, New York	6.77 1/2	6.62 1/2	6.60	7.35
Lead, St. Louis	7.95	7.75	7.87 1/2	7.25
Lead, New York	8.25	8.00	7.62 1/2	7.50
Tin (Straits), New York	48.00	46.75	46.50	38.25
Antimony (Asiatic), N. Y.	10.00	9.75	8.65	6.60

Based on prices of steel bars, beams, tank plates, plain wire, open-hearth rails, black pipe and black sheets	These products constitute 88 per cent of the United States output of finished steel	Dec. 31, 1923, 2.775c. Dec. 11, 1923, 2.775c. Jan. 9, 1923, 2.446c. 10-year pre-war average, 1.689c.
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Composite Price, Jan. 8, 1924, Finished Steel, 2.775c. Per Lb.

Based on average of basic and foundry irons, the basic being Valley quotation, the foundry an average of Chicago, Philadelphia and Birmingham	Dec. 31, 1923, \$21.88 Dec. 11, 1923, 21.88 Jan. 9, 1923, 25.96 10-year pre-war average, 15.72
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plied with business than 30 days ago and with competition for orders modified by that condition, there is unmistakable firmness in prices.

The pig iron market has been enlivened by a report that the Steel Corporation was a recent purchaser of 50,000 tons of basic pig iron at a price of \$22.50, Valley furnace. The report, which was positively denied by officials in a position to know, appears to have originated in scrap iron and steel circles and probably was started with the ultimate purpose of helping the scrap market to a point where yard holdings might be moved at a profit. There has been a further advance of about 50c. a ton in heavy melting steel scrap, the Carnegie Steel Co. having taken a round lot at \$20.

A cold snap with unusual severity has slightly strengthened the situation in domestic coal and coke, but has been without effect upon fuel for industrial

uses. There is no real strength in furnace coke and buyers still have the upper hand of the coal market. The situation does not yet suggest the possibility of a strike of the coal miners when the present agreement expires April 1, but there is a more general tendency to expect trouble of some sort because of the handicap which the union mine operators have in meeting competition from the non-union fields, some of which are operating on a much lower wage scale than now prevails in the union districts and in the Connellsville region.

Finishing mill operations are on a rising scale following the lull incident to the observance of the yuletide holiday, and here in Pittsburgh suspensions forced by inundations from the high stage of the rivers. Steel work operations in the district are not very much heavier than they have been and blast

furnace operations embrace about the same number of stacks that were active last month. The furnace of the Penn Iron & Coal Co., Dover, Ohio, is to be blown in late this week, but the stack of the Sharpsville Furnace Co., Sharpsville, Pa., will be blown out late this week or the fore part of next week.

Pig Iron.—The market is merely marking time. Demand runs exclusively to small lots and there is probably more business in foundry iron than of all the other grades combined. While there are occasional sales of foundry grade at \$22.50 and even \$23 for the base grade, it is still possible to secure this kind of iron at \$22. There has not been enough business in the other grades to establish any change of prices. The reported purchase of 50,000 tons of basic iron by the Steel Corporation not only was denied but actually found little credence in the trade, especially at the price at which it was reported to have been made. If the Steel Corporation really wanted any such quantity of iron, it could have produced it at much under the reported price by blowing in a few of its idle furnaces. The Carnegie Steel Co. is operating 43 of its 59 furnaces and the American Steel & Wire Co. has an idle furnace at Donora, Pa.

We quote Valley furnace, the freight rate for delivery to the Cleveland or Pittsburgh district being \$1.76 per gross ton:

Basic	\$21.00
Bessemer	23.00
Gray forge	\$21.50 to 22.00
No. 2 foundry	22.00 to 22.50
No. 3 foundry	21.50 to 22.00
Malleable	22.00 to 22.50
Low phosphorus, copper free	29.00 to 30.00

Ferroalloys.—There is little activity and no change in prices. Steel companies are not yet greatly enlarging steel works operations and seem to be well covered against current and nearby requirements of the principal steel alloys. Ferromanganese still is priced at \$109, seaboard base, by domestic producers and at \$110 c.i.f. seaboard, duty paid, by British makers. Ferrosilicon appears fully established at \$75, delivered, for 50 per cent. Spiegeleisen is \$38 to \$39, furnace, for 20 per cent material; sales run to small lots, but are fairly frequent. Prices are given on page 191.

Semi-Finished Steel.—Fresh features are lacking. Such open market activity as there is in billets and slabs is at \$40 and while some mills are holding to a nominal quotation of \$42.50, it is not representative of today's possibilities on these forms. There are very few sheet bar inquiries in the market, as most sheet and tin plate makers have regular sources of supplies and have placed contracts for their first quarter requirements. Sheet mill operations have not increased much and specifications reflect both that condition and the fact that most mills carried some tonnage over from the last quarter of last year. The recognized market on sheet bars is \$42.50, Pittsburgh or Youngstown. Forging billets and blooms still are priced at \$45, but not much business is coming out. Leading skelp makers report the placing of contracts by regular customers, but little or no buying from other sources; contracts are believed to have been written at 2.30c. for grooved, universal and sheared skelp, but the common quotation today is 2.35c. Wire rods are not moving with much snap either on contracts or orders. Prices are given on page 191.

Wire Products.—Reports about business still are of a cheerful tenor, with both jobbers and manufacturing consumers contracting and specifying fairly freely, while there is a fair amount of business in the shape of orders. It is admitted, however, that bookings are on a much lighter scale than they were at this time last year. The explanation probably is to be found in the absence of any signs of higher prices in the near future, and because there are few, if any, of the mills that are so heavily committed that they cannot give prompt shipment service on new business. Prices are given on page 190.

Steel Rails.—The billet light rail market is a good deal firmer at 2.25c., base, than it has been. While it has been denied by leading makers that this price has been shaded, it develops that some makers took business and were glad to get it at 2c. a few weeks ago. It is

buyers' testimony that nothing less than 2.25c. now can be done. Unless it is because of less competition from rerolled rails, due to the advance in old rails, the firmer position of billet rails is hard to explain, since there has been no particular increase in demand from the coal mine operators, who constitute the principal source of outlet.

We quote light rails rolled from billets at 2.25c. base (25-lb. to 45-lb.); rerolled rails, 1.85c. to 2c. base (12-lb. to 45-lb.), f.o.b. mill; standard rails, \$43 per gross ton mill, for Bessemer and open-hearth sections.

Iron and Steel Bars.—Most makers of steel bars open the new year with a very fair sized order book, this being particularly true of those makers who supply manufacturers of cold-finished steel bars and bolts, nuts and rivets. Specifications for January tonnages are reported to be coming in well. There is close observance of the regular price of 2.40c., base Pittsburgh. Iron bars still are slow of sale but steady in price.

We quote soft steel bars, rolled from billets, at 2.40c. base; bars for cold-finishing of screw stock analysis, \$3 per ton over base; reinforcing bars, rolled from billets, 2.40c. base; refined iron bars, 3.25c. base, in carload lots or more, f.o.b. Pittsburgh.

Tubular Goods.—A considerable expansion in orders and specifications has marked the first full week of the new year in standard pipe and bookings, which in December were barely equal to production, now are beginning to run ahead and backlog tonnages are accumulating. Inquiry for oil country goods and line pipe is increasing, but actual orders are rather light. South Penn Oil Co. is understood to have recently closed for 20 miles of 8-in. pipe. International Petroleum Co. is said to be getting prices on 500 miles of pipe for a line from its wells in Columbia to the coast. Boiler tubes still are laggard and some lack of price stability is evident. Discounts are given on page 190.

Sheets.—The most interesting phase of the situation is the increased firmness of prices resulting from the fact that most mills now are well provided with business. While cut prices on black and galvanized sheets have not entirely disappeared, there are very few mills now making them, and then only on tonnages for delivery at convenience of the mill, which in this case means early delivery. As was to be expected, in view of its strict observance of quotations, the American Sheet & Tin Plate Co. is not so well provided with business as most of its competitors. Prices are given on page 190.

Tin Plate.—Makers quite generally having obligated themselves against probable production over the first half of this year, interest in the market centers entirely on specifications. These are coming along very well to the leading company and reasonably well to the independents, the difference being accounted for largely in the storage facilities of consumers. Customers of the American Sheet & Tin Plate Co. include two of the largest container manufacturers in the country, who can take the tin plate out and store it long in advance of the time it is actually required. There are occasional reports of business being lost at \$5.50 by some mills, but generally that price is firmly maintained.

Hot-Rolled Flats.—Not much new business has been coming out lately, chiefly because leading consumers have covered their requirements for the first quarter and some of them, notably the automotive industry, are not yet in a position to know their requirements beyond that period. There is general observance of the price of 3c., base, on hoops, bands and strips. Prices are given on page 190.

Cold-Rolled Strips.—Fresh market activity is lacking, but buyers are reported to be specifying fairly well on contracts and with makers well supplied with orders competition for business is slight and 5c. base, Pittsburgh, may be said to be a well established quotation.

Bolts, Nuts and Rivets.—Most producers have a good complement of first quarter business, but specifications reflect sharply the fact that the inventory period is not yet over. New business also is light at the moment, but there is a fairly close observance of quoted discounts and prices. They are given on page 190.

Structural Material.—All mills in this territory are holding firmly to 2.50c. for large structural shapes, and while current business is not particularly large, the inquiry is so heavy as to suggest active buying before the year is far along. Steel for the new steel plant of the Ford Motor Co., Detroit, amounting to 9000 tons will be fabricated by a local interest. Prices are given on page 190.

Plates.—Orders are more numerous but run chiefly to small tonnages. Not much car, tank or barge business lately has come to the Pittsburgh district shops. The mills are not so well provided with orders that there is any delay in shipments on new business. There is still very firm adherence to the regular market price. Prices are given on page 190.

Cold-Finished Steel Bars and Shafting.—Makers here describe the market as firm at 3c., base, Pittsburgh, and some claim to be getting that price in competitive Western territory to which Chicago has an advantage in freight rates. Generally, however, local producers still find they must equalize freight charges with Chicago to secure business in the competitive area. Business is good, but there is room for improvement; too many automobile parts makers lack specifications from the automobile builders for business to be really brisk. Ground shafting holds at 3.40c., base, f.o.b. mill for carload or larger lots.

Track Supplies.—Makers of standard spikes are well supplied with business and are firm in their price ideas. There is little current demand for small spikes and makers have few orders on which to fall back, but these conditions do not seem to be an influence upon prices. Makers of tie plates in this district are well committed against production over the next 60 days. Prices are given on page 190.

Old Material.—Another purchase by the Carnegie Steel Co. of heavy melting steel, this time of about 5000 tons, at \$20, has served to establish that grade at that price. While the week has seen no important purchases of this grade by independent steel companies, it is the testimony of those who took some of the Carnegie tonnage that offerings are very scant and that there seems to be none of this grade available at less than \$20. Further advance of 50c. a ton has taken place in compressed sheets, which now are quotable, based on sales, at \$18 to \$18.50. The market is looking up on the specialties, but this change is more in sympathy with heavy melting grade than because of a material increase in the demand, most steel foundries still being out of the market. The market also is gaining strength in the lighter grades of open-hearth scrap as well as in the blast furnace grades, supplies being very meager. Splice bars offered by the Pennsylvania Railroad in its January list are understood to have been bought at \$21.75 per gross ton, delivered, and the heavy melting steel at \$21.50.

We quote for delivery to consumers' mill in the Pittsburgh and other districts taking the Pittsburgh freight rate as follows:

Per Gross Ton	
Heavy melting steel.....	\$20.00
No. 1 cast, cupola size.....	\$21.00 to 21.50
Rails for rolling, Newark and Cambridge, Ohio; Cumberland Md.; Huntington, W. Va., and Franklin, Pa.....	20.50 to 21.50
Compressed sheet steel.....	18.00 to 18.50
Bundled sheets, sides and ends.....	16.50 to 17.00
Railroad knuckles and couplers.....	21.00 to 21.50
Railroad coil and leaf springs.....	21.00 to 21.50
Low phosphorus blooms and billets ends.....	23.00 to 24.00
Low phosphorus plate and other material.....	22.00 to 23.00
Railroad malleable.....	18.50 to 19.00
Steel car axles.....	21.00 to 21.50
Cast iron wheels.....	19.00 to 19.50
Rolled steel wheels.....	21.00 to 21.50
Machine shop turnings.....	15.00 to 15.50
Sheet bar crops.....	20.00 to 20.50
Heavy steel axle turnings.....	16.50 to 17.00
Short shoveling turnings.....	16.00 to 16.50
Heavy breakable cast.....	18.50 to 19.00
Stove plate.....	14.50 to 15.00
Cast iron borings.....	16.00 to 16.50
No. 1 railroad wrought.....	15.50 to 16.00
No. 2 railroad wrought.....	20.00

Coke and Coal.—The furnace coke market still is soft. Spot tonnages of the best brands readily are obtainable at \$4 per net ton at ovens, while good coke can be had at \$3.75, and in some instances the latter

price has included a brokerage commission. Too many producers find it cheaper to keep ovens in operation than to blow them out, and the result is a pretty constant oversupply. The contract market still is quotable from \$4 to \$4.25, and one contract for the present quarter recently was closed at the higher figure, involving about 10,000 tons a month. Spot foundry coke is priced anywhere from \$4.75 to \$6, with \$5.50 the more common maximum. The contract foundry coke market remains at \$5.50 to \$6.50. Mine run steam coal ranges from \$1.90 to \$2.10 for Pittsburgh steam coal, while coking grade runs from \$1.85 to \$2.15, and gas grade is held at \$2.25.

Canadian Scrap Market

Toronto, Ont., Jan. 7.—Little interest has featured the Canadian iron and steel scrap market during the past couple of weeks chiefly as a result of the holiday season and the fact that foundries and steel plants curtailed productive operations during this period. While consumers have shown but little interest in old material, buying in small tonnages was reported by both Toronto and Montreal dealers, but in all cases these were for material required for immediate use and so far first quarter buying has not become heavy. Inquiries are now making their appearance and while in most cases tonnages involved are comparatively small, these leave the impression that melters are more concerned with regard to raw material, and are preparing for an active business in the early future. Foundry interests in Ontario and Quebec are preparing to submit bids on castings and parts for automobile construction and it is the general opinion that a large volume of this class of work will be placed during the next month or six weeks. Toronto scrap dealers are more optimistic with regard to business in the future than they have been for a long time, and it is the general opinion that the demand for practically all lines of scrap will shortly become more active. Canadian dealers' buying prices are as follows:

	Toronto	Montreal
	Gross Tons	
Steel turnings.....	\$10.00	\$7.00
Machine shop turnings.....	10.00	7.00
Wrought pipe.....	8.00	7.00
Rails.....	12.00	12.00
No. 1 wrought scrap.....	12.00	13.00
Heavy melting steel.....	12.00	10.00
Steel axles.....	15.00	18.00
Axes wrought iron.....	18.00	20.00
Net Tons		
Standard car wheels.....	15.00	14.00
Malleable scrap.....	15.00	12.00
Stove plate.....	15.00	14.00
No. 1 machinery cast.....	18.00	19.00

Detroit Scrap Market

DETROIT, Jan. 8.—The market on old material has a very strong tone. Although there has been no advance over prices quoted a week ago, there has been considerable buying and dealers have been stocking some materials. Jobbing foundries and general manufacturers are getting back toward normal production after the inventory and holiday season, the malleable plants being the only melters that are running considerably below normal. Prices are the same as quoted a week ago.

The following prices are quoted on a gross ton basis f.o.b. cars producers' yards, excepting stove plate, No. 1 machinery cast and automobile cast, which are quoted on a net ton basis:

Heavy melting steel.....	\$15.00 to \$16.00
Shoveling steel.....	15.00 to 16.00
Borings.....	11.50 to 12.50
Short turnings.....	11.50 to 12.00
Long turnings.....	10.50 to 11.50
No. 1 machinery cast.....	18.00 to 18.50
Automobile cast.....	24.00 to 25.00
Hydraulic compressed.....	13.50 to 14.25
Stove plate.....	16.00 to 17.50
No. 1 busheling.....	11.00 to 11.50
Sheet clippings.....	10.00 to 10.50
Flashings.....	12.50 to 13.50

All records for building permits were broken in St. Louis during 1923, 14,793 permits being issued for improvements to cost \$41,443,755, against 13,580 permits in 1922 for improvements costing \$25,210,503, a gain of \$16,233,252, or 64 per cent. The new construction in 1923 represents a total worth of \$36,102,475, and \$5,341,280 alterations.

Chicago

Buying of Steel by Railroads, Automobile Companies and Jobbers Is Active

CHICAGO, Jan. 8.—Business booked by steel mills during the first week of the new year has further strengthened their belief that the first quarter will be an active period. Liberal buying by jobbers, railroads, automotive interests, miscellaneous manufacturers and further expansion in building are all favorable indications. In fact, in view of present obligations and those in prospect, mills feel that they can expect to maintain reasonably full operations throughout the first half.

Railroads have placed large orders for track supplies during the week and are pressing producers for shipments of rails and fastenings against contracts. Large additional car orders seem assured. Bids are in on 3057 refrigerator cars for the Pacific Fruit Express and 775 for cars of the same type for the Western Pacific, with the likelihood that orders will be placed shortly. The New York Central will buy 10,000 freight cars.

Some of the automobile manufacturers are slow in getting into full production, but nevertheless the motor car industry expects 1924 output to exceed that of the record year, 1923. Building work pending and in immediate prospect is heavy and even the farm implement industry, which has produced little in the past three years, looks for a fairly good year and has done some buying of both steel and pig iron.

Mills are still able to make reasonably prompt deliveries against new business, but their improved position is indicated by the fact that their new commitments are heavier than shipments. This is a decided turn for the better, even though shipments are somewhat lighter than they were some months ago. Local steel works operations remain unchanged, but the Illinois Steel Company, which is running at 75 per cent of ingot capacity, expects to reach a 78 per cent rate before the close of the week. The Inland Steel Co. is also on a 75 per cent basis.

Ferroalloys.—Ferromanganese is somewhat more active and a few sales have been made at \$110, New Orleans. An inquiry for one carload of spiegeleisen is pending. This commodity is quoted at \$40, eastern furnace, for carlots and \$39 for larger tonnages.

We quote 80 per cent ferromanganese, \$117.56, delivered; 50 per cent ferrosilicon, \$75, delivered; spiegeleisen, 18 to 22 per cent, \$47.58 to \$48.58, delivered.

Pig Iron.—Prices are now firm at a minimum of \$23.30 base local furnace, although the market remains rather quiet. Scattered orders for both prompt and forward delivery have brought the full price, although the view is held in some quarters that an attractive tonnage might bring out a concession. Possibly one reason for lack of demand is the fact that many foundries have not yet accumulated satisfactory bookings for first quarter. This is ascribed rather to the procrastination of castings buyers than to any real lack of business. For example, certain melters serving the automobile industry are now operating at a curtailed rate, although the programs of the motor car builders call for even heavier production than in 1923. Greater interest is being manifested in second quarter iron and some tonnage has been booked for that period at present prices. Furnaces, however, are rather reluctant to sell for that delivery because of the possibility of a coal strike on April 1. A down state melter is inquiring for 2400 tons of foundry and 1500 tons of malleable for second quarter. A Chicago user wants 1000 tons of foundry for first quarter. A Wisconsin buyer is in the market for 300 tons of foundry for prompt delivery. A Fox River Valley melter who is about to resume operations is inquiring for 200 tons of foundry. Southern foundry ranges from \$21, base Birmingham, for early

shipment to \$22 for forward delivery. Sales have been few, perhaps the largest being 250 tons for first quarter, which was sold at \$21, base Birmingham. Charcoal, silvery and low phosphorus have been quiet.

Quotations on Northern foundry high phosphorus malleable and basic irons are f.o.b. local furnace and do not include an average switching charge of 61c. per ton. Other prices are for iron delivered at consumer's yard or when so indicated, f.o.b. furnace other than local.

Lake Superior charcoal averaging	
sll. 1.50, delivered at Chicago..	\$29.15
Northern coke, No. 1, sll. 2.25 to	
2.75	24.00
Northern coke, foundry, No. 2,	
sll. 1.75 to 2.25	23.50
Malleable, not over 2.25 sll.....	23.50
Basic	23.50
High phosphorus	23.50
Southern No. 2	\$27.01 to 28.01
Low phos., sll. 1 to 2 per cent,	
copper free	34.00 to 34.79
Silvery, sll. 8 per cent.....	37.29

Bars.—Sales of soft steel bars by local mills during the year just closed were probably the heaviest in history. Demand thus far in 1924 has been of encouraging proportions. Jobbers and automotive interests have bought freely and miscellaneous manufacturing consumers likewise are replenishing their scanty stocks. The outlook in the building industry is favorable and reports from agricultural implement plants indicate steady, though gradual, improvement in their condition. Mill bookings exceed shipments and prices are firm at 2.50c. Chicago. Buying of bar iron is also reviving, although less rapidly, and one mill now on a single turn basis has accumulated about three weeks' work ahead. Demand for rail steel bars is likewise improving, with mills booked from three to four weeks. This commodity is favorably affected by seasonal activity in fence posts, which is now getting into full swing.

Mill prices are: Mild steel bars, 2.50c., Chicago; common bar iron, 2.40c., Chicago; rail steel, 2.30c., Chicago mill.

Jobbers quote 3.20c. for steel bars out of warehouse. The warehouse quotation on cold-rolled steel bars and shafting is 4c. for rounds and 4.50c. for flats, squares and hexagons.

Jobbers quote hard and medium deformed steel bars at 2.75 to 3c. base; hoops, 4.45c.; bands, 3.95c.

Cast Iron Pipe.—Spring Wells, Mich., has placed 585 tons with the Lynchburg Foundry Co. The United States Cast Iron Pipe & Foundry Co. has contracts for 600 tons for Kalispell, Mont., and 2800 tons for the Public Service Co. of Northern Illinois. Toledo takes bids Jan. 9 on 1400 tons of six to 12-in. Logansport, Ind., took figures yesterday on 700 tons. A growing scarcity in 4-, 6- and 8-in. pipe is being reflected in premiums of from \$1 to \$3 a ton over the regular base prices.

We quote per net ton, f.o.b. Chicago, as follows: Water pipe, 4-in., \$59.20 to \$60.20; 6-in. and above, \$55.20 to \$56.20; class A and gas pipe, \$5 extra.

Bolts and Nuts.—Specifications are heavier and discounts are firm. Bolt and nut plants are again operating on a satisfactory basis, a few of them, in fact, running full. The rivet market, on the other hand, is still weak. Small rivets have been quoted at as low as 75 and 10 off. Large rivets are none too steady at \$3 Chicago.

Jobbers quote structural rivets, 3.75c.; boiler rivets, 3.95c.; machine bolts up to $\frac{1}{2}$ x 4 in., 55 and 5 per cent off; larger sizes, 55 and 5 off; carriage bolts up to $\frac{1}{2}$ x 6 in., 50 and 5 off; larger sizes, 50 and 5 off; hot pressed nuts, squares and hexagons, tapped, \$3.50 off; blank nuts, \$3.50 off; coach or lag screws, gimlet points, square heads, 60 and 5 per cent off.

Wire Products.—While demand cannot yet be described as heavy, orders are coming in in much better volume, especially from manufacturing consumers. Purchasers of woven wire fence are liberal. Operations are showing improvement now, being at considerable better than 75 per cent for the leading interest. Mill prices, which are unchanged, are shown on page 190.

We quote warehouse prices f.o.b. Chicago: No. 6 to No. 9 bright basic wire, \$3.90 per 100 lb.; extra for black annealed wire, 15c. per 100 lb; common wire nails, \$3.65c. to 3.80c. per 100 lb.; cement coated nails, 3.10c. to 3.25c. per keg.

Reinforcing Bars.—Lettings during the week were few, but a number of attractive new projects have appeared, adding to the already large amount of pending work. A building for S. D. Childs & Co., Chicago, on

which general contract bids have just been taken, will involve 400 tons. A freight house for the Chicago, Indianapolis & Louisville at Indianapolis will require 400 tons. In the East, an elevator for the Philadelphia & Reading at Philadelphia will take 1600 tons. The price situation is still unsteady, although showing signs of gathering strength.

Lettings include:

Eight-story apartment building for John J. Barlum, Detroit, 215 tons to McRae Steel Co.

Retaining walls for Art Institute, Chicago, 100 tons to Corrugated Bar Co.

Neuhoff Packing Co. plant, Nashville, Tenn., 100 tons to Corrugated Bar Co.

Pending business includes:

Elevator for Philadelphia & Reading, Philadelphia, 1600 tons.

Building for S. D. Childs & Co., Chicago, 435 tons, general contract bids taken.

Chicago, Indianapolis & Louisville, freight house, Indianapolis, 400 tons.

Chicago, Burlington & Quincy R. R., 400 tons.

School, Ironwood, Mich., 400 tons, revised bids on general contract to be taken Jan. 8.

High School, Sioux City, Iowa, 200 tons.

Rails and Track Supplies.—Purchases of track supplies have been heavy, one local producer having booked orders for 6000 tons of tie plates, 15,000 kegs of track spikes, 12,000 kegs of spikes and bolts and 5000 tons of angle bars. A pending inquiry calls for 10,000 tons of tie plates. A matter of surprise to local mills is the rapidity with which shipping instructions against rails and track supplies are being received from the railroads. Apparently the carriers wish to be sure that supplies are on hand when spring track work is started.

Standard Bessemer and open-hearth rails, \$43; light rails, rolled steel, 2.25c., f.o.b. makers' mills.

Standard railroad spikes, 3.10c. mill; track bolts with square nuts, 4.10c. mill; steel tie plates, 2.60c., f.o.b. mill; angle bars, 2.75c., f.o.b. mill.

Jobbers quote standard spikes out of warehouse at 3.75c. base, and track bolts, 4.75c. base.

Plates.—Fully 40,000 tons of plates, shapes and bars has been booked by a local mill for Southern Pacific cars to be built in Western shops. No tank orders are reported and the only inquiry before the trade is one from the Government for two 50,000-bbl. storage tanks and two smaller tanks requiring a total of 600 tons, for the Mare Island naval station near San Francisco. Miscellaneous demand for plates is steadily improving. Not only manufacturing users, but jobbers are covering for their first quarter needs. Prices are firm at 2.60c. Chicago.

The mill quotation is 2.60c., Chicago. Jobbers quote 3.30c. for plates out of stock.

Warehouse Prices.—Competition among local jobbers has developed weakness in nails and shading to the extent of 15c. is rather common on attractive orders for both common wire and cement coated nails. The present range of prices is indicated under the paragraph on wire products.

Sheets.—As the position of the mills becomes stronger, observance of the Steel Corporation prices is growing more general. On black, however, 3.75c. base Pittsburgh is still quoted by a few mills, and on galvanized 4.90c. base Pittsburgh has not entirely disappeared.

Mill quotations are 3.75c. to 3.85c. for No. 28 black, 3c. for No. 10 blue annealed and 5c. for No. 28 galvanized, all being Pittsburgh prices, subject to a freight rate to Chicago of 34c. per 100 lb.

Jobbers quote, f.o.b. Chicago, 4c. for blue annealed, 4.70c. for black and 5.85c. for galvanized.

Structural Material.—Building operations during the coming 12 months are expected to equal those of 1923, which was a record year. A large amount of work is now being figured on and much more is in prospect. The New Palmer House, Chicago, involving 11,000 tons, is expected to come up for bids soon. Figures are being taken this week on train sheds for the Chicago Union Station, requiring 5000 tons. The American Bridge Co. is low bidder on 1700 tons for the substructure of the Lake Shore Athletic Club, Chicago, and plans on the superstructure, involving 4000 tons, have been completed. Bids will be taken this week on a

freight house for the Louisville & Nashville at New Orleans, requiring 1200 tons. A north side motion picture theater for Balaban & Katz, Chicago, will take 1700 tons. Lettings during the week total 7264 tons, of which 4000 tons is accounted for by assembly plants for the Ford Motor Co. at Jacksonville, Fla., Memphis, Tenn., and Charlotte, N. C., all of which were placed with the Virginia Bridge & Iron Co. Revised bids have been asked on the Ford assembly plant at Philadelphia, requiring 2200 tons. Plain material prices are firm at 2.60c. Chicago.

The mill quotation on plain material is 2.60c. Chicago. Jobbers quote 3.30c. for plain material out of warehouse.

Old Material.—The failure of the Steel Corporation to buy for Gary has had a depressing effect on the market. A small interest has bought 1000 tons of heavy melting at \$17 delivered, but the leading independent is making heavy rejections, being unable to absorb shipments as fast as they are delivered. For the time being, at any rate, there appears to be a surplus of scrap in this market, and the hope of dealers lies in market centers east of here, where prices are strong and advancing. In fact, prices at Ohio points will not have to advance much more before shipments from Chicago can be made profitably. Outside of scattered purchases of cast and malleable grades there are few evidences of consumer interest in scrap. Railroad offerings include Santa Fe, 3100 tons; Great Northern, 2000 tons; Pere Marquette, 1200 tons; Baltimore & Ohio Chicago Terminals, 600 tons; Michigan Central and Erie, blind lists.

We quote delivery in consumers' yards, Chicago and vicinity, all freight and transfer charges paid, as follows:

Per Gross Ton

Iron rails	.....	\$20.50 to \$21.00
Cast iron car wheels	.....	20.00 to 20.50
Relaying rails, 56 and 60 lb.	.....	26.00 to 27.00
Relaying rails, 65 lb. and heavier	.....	32.00 to 35.00
Forged steel car wheels	.....	20.00 to 20.50
Railroad tires, charging box size	20.50 to 21.00	
Railroad leaf springs, cut apart	20.50 to 21.00	
Rails for rerolling	.....	18.00 to 18.50
Steel rails, less than 3 ft.	19.50 to 20.00	
Heavy melting steel	.....	16.75 to 17.25
Frogs, switches and guards cut apart	.....	16.75 to 17.25
Shoveling steel	.....	16.50 to 17.00
Drop forge flashings	.....	12.50 to 13.00
Hydraulic compressed sheets	.....	13.50 to 14.00
Axle turnings	.....	14.00 to 14.50
Steel angle bars	.....	18.50 to 19.00

Per Net Ton

Iron angle and splice bars	.....	21.00 to 21.50
Iron arch bars and transoms	.....	20.50 to 21.00
Iron car axles	.....	26.00 to 26.50
Steel car axles	.....	18.00 to 18.50
No. 1 busheling	.....	13.00 to 13.50
No. 2 busheling	.....	8.50 to 9.00
Cut forge	.....	14.75 to 15.25
Pipes and flues	.....	11.00 to 11.50
No. 1 railroad wrought	.....	15.00 to 15.50
No. 2 railroad wrought	.....	14.75 to 15.25
Steel knuckles and couplers	.....	18.50 to 19.00
Coil springs	.....	19.50 to 20.00
No. 1 machinery cast	.....	20.00 to 20.50
No. 1 railroad cast	.....	19.00 to 19.50
No. 1 agricultural cast	.....	19.00 to 19.50
Low phos. punchings	.....	16.00 to 16.50
Locomotive tires, smooth	.....	17.50 to 18.00
Machine shop turnings	.....	9.00 to 9.50
Cast borings	.....	11.00 to 11.50
Short shoveling turnings	.....	11.00 to 11.50
Stove plate	.....	16.50 to 17.00
Grate bars	.....	15.50 to 16.00
Brake shoes	.....	17.00 to 17.50
Railroad malleable	.....	18.00 to 18.50
Agricultural malleable	.....	18.00 to 18.50

Paul R. Higginbotham has opened offices under the name of the Engineering & Equipment Co., 233-35 Commercial Trust Building, Philadelphia, for the sale of new and used machinery and equipment for metal-working, also boilers and conveying and electrical equipment, although it will specialize in machine tools. Mr. Higginbotham is not new to the machinery business, having been engaged for some time in the sale of various lines of equipment. Prior thereto he was works manager for the Budd Wheel Co., Philadelphia, the Firestone Steel Products Co., Akron, Ohio, and for a Western automobile manufacturer.

New York

Sheet Prices Stiffening—Pig Iron Dull, with Little Inquiry Pending

NEW YORK, Jan. 8.—The pig iron market is exceedingly dull and the only inquiry that has appeared this week is one for 1000 tons for prompt delivery to a machinery manufacturer. This inquiry and rather frequent requests for anticipation of shipments are taken as favorable indications, but very little buying is expected in the near future, owing to the fact that melters are as a rule well covered for the first quarter. It is understood that a part of the New York Central tonnage of about 1500 tons, pending for several weeks, has not yet been awarded and that about 700 tons for Elkhart, Ind., went to a Western furnace. The usual quotations are \$22, base, Buffalo, and \$23, eastern Pennsylvania. These prices are shaded to a moderate extent by resale iron. The market is untested.

We quote delivered in the New York district as follows, having added to furnace price \$2.27 freight from eastern Pennsylvania, \$4.91 from Buffalo and \$5.44 from Virginia:

East. Pa. No. 1X fdy., sil. 2.75 to 3.25....	\$25.77
East. Pa. No. 2X fdy., sil. 2.25 to 2.75....	25.27
East. Pa. No. 2, sil. 1.75 to 2.25....	25.27
Buffalo, sil. 1.75 to 2.25....	26.91
No. 2X Virginia, sil. 2.25 to 2.75....	30.44
No. 2 Virginia, sil. 1.75 to 2.25....	29.94

Ferroalloys.—There are no special features in either the ferromanganese or spiegeleisen markets. Demand is moderate and sales are confined mostly to carload lots at prevailing prices, which are unchanged. Inquiries for ferromanganese total about 1000 tons. Contracts for 1924 consumption for 50 per cent ferrosilicon and for ferrochromium have been quite generally negotiated. The quotations for ferrochromium of one producer are slightly lower than last year at 10.75c. for the alloy containing the maximum of 6 per cent carbon, and 10.50c. for the 6 to 7 per cent carbon alloy, both on a basis of pounds of contained chromium delivered, with freight allowed.

Cast-Iron Pipe.—A few orders are coming from private water and gas companies for spring delivery, and there is a fair volume of inquiry. Municipal tenders from the new administrations in New England, which took office Jan. 1, are expected in a few weeks. Prices continue firm, with concessions still made to buyers willing to accept winter delivery. We quote per net ton, f.o.b. New York, in carload lots, as follows: 6-in. and larger, \$61.60 to \$63.60; 4-in. and 5-in., \$66.60 to \$68.60; 3-in., \$76.60 to \$78.60, with \$5 additional for Class A and gas pipe. The usual seasonal quiet has set in. Jobbers are well stocked and receiving low-priced material bought at the high discounts of last fall. No further active buying is expected until the spring demand begins and jobbers' stocks are reduced. We quote discounts of both Northern and Southern makers, f.o.b. New York, in carload lots, as follows: 6-in., 29½ to 35% per cent off list; heavy, 39½ to 45% per cent off list.

Warehouse Business.—Little activity is noted, but prices continue firm in all products. Demand for structural material, which was active until well toward the end of December, has now declined. Although there is only a light volume of business reported in sheets, the market continues fairly firm on both black and galvanized. In most cases sellers are holding out for 4.60c. on black and 5.60c. per lb. base on galvanized, with small blocks at higher prices.

Finished Iron and Steel.—Excepting the plate mills, the steel companies have started the new year with somewhat better order books than had been expected. While there was no spectacular buying in December, aside from some large tonnages of structural material, the aggregate of tonnage booked in nearly all lines was better than is customary in the last month of the year. There is still some hesitancy on the part of consumers in placing contracts for first quarter, and this is particularly true in the case of jobbers, who see no reason for anticipating requirements, believing that prices will neither advance nor decline in the first quarter. Some fair-sized stock orders are being placed by

jobbers whose stocks have been allowed to run low, and there is also replenishment on a small scale among manufacturing consumers. One steel company, in making a canvass of its customers, found that less than 10 per cent had enough steel in stock or on order to carry through the first quarter. Prices show no further weakening, and in a few instances are slightly firmer. An instance is the action of some sheet mills, which have been offering black and galvanized at concessions of \$2 a ton for spot shipment, in withdrawing these lower prices, holding for 3.85c. on black and 5c. on galvanized. Soft steel bars are firm at 2.40c., Pittsburgh, from mills, but jobbers of concrete reinforcing bars are meeting the mill price for bars out of stock and in a few cases have gone below 2.40c. This situation is due largely to recent receipts from mills of bars contracted for some time ago at prices below the current level. Inquiries for concrete reinforcing bars from the Eastern district total 3000 to 4000 tons, of which one of the largest items is 400 tons for two school buildings in Philadelphia. Activity in structural steel is not so important as before the holidays, but a fair volume of business is still before the fabricating trade. Plates are dull, with not enough tonnage offering to test prices. In car work the only important inquiry is from the Pennsylvania Railroad, which asks bids on 3000 all-steel box car bodies. This road has a total of 10,000 trucks, for which it is believed car bodies will eventually be bought. Car shops will, as a rule, reach the end of their present orders early in February.

We quote for mill shipments, New York delivery, as follows: Soft steel bars, 2.74c.; plates and structural shapes, 2.74c. to 2.84c.; bar iron, 2.74c.

Coke.—A few distress tonnages appear occasionally at lower than current prices, but on the whole the market is fairly firm at \$5 to \$5.50 for prompt shipment standard foundry coke and \$4 to \$4.25 per ton for standard furnace, with medium sulphur at \$3.75 per ton. By-product is quoted at \$10.91, Newark and Jersey City, N. J.

Old Material.—Prices continue firm, but the market is quiet, except for shipments on old contracts and transactions between dealers. Heavy melting steel continues firm at \$17 per ton eastern Pennsylvania. Cast borings are still quotable at \$14 per ton delivered to an eastern Pennsylvania consumer and machine shop turnings at \$14.50 per ton delivered, while borings and turnings are going to an eastern Pennsylvania consumer at \$12.50 per ton. Specification pipe has advanced to \$17 per ton, which is being paid for delivery to a consumer at Lebanon, Pa., while delivery to Milton, Pa., is still \$16 per ton. While stove plate continues unchanged at \$16.50 per ton delivered eastern Pennsylvania and to foundries in New Jersey, the buying price New York shows an advance as a result of a decrease in the freight rate to West Mahwah, N. J., from \$2.52 per ton to \$2.02 per ton.

Buying prices per gross ton New York follow:	
Heavy melting steel, yard.....	\$13.00 to \$13.50
Steel rails, short lengths, or equivalent.....	13.75 to 14.25
Rails for rolling.....	15.00 to 16.00
Relaying rails, nominal.....	25.00 to 26.00
Steel car axles.....	16.00 to 17.00
Iron car axles.....	24.00 to 24.50
No. 1 railroad wrought.....	14.50 to 15.00
Forge fire.....	10.00 to 10.50
No. 1 yard wrought long.....	12.00 to 12.50
Cast borings (clean).....	10.00 to 10.50
Machine-shop turnings.....	10.50 to 11.00
Mixed borings and turnings.....	9.25 to 9.75
Iron and steel pipe (1 in. diam., not under 2 ft. long).....	12.75 to 13.25
Stove plate.....	12.50 to 14.50
Locomotive grate bars.....	12.50 to 13.00
Malleable cast (railroad).....	14.00 to 15.00
Cast iron car wheels.....	15.00 to 15.50

Prices which dealers in New York and Brooklyn are quoting to local foundries per gross ton follow:	
No. 1 machinery cast.....	\$19.00 to \$20.00
No. 1 heavy cast (columns, building materials, etc.), cupola size.....	18.00 to 19.00
No. 1 heavy cast, not cupola size, No. 2 cast (radiators, cast boilers, etc.).....	14.50 to 15.50
	16.00 to 17.00

The Lalance-Grosjean Mfg. Co., Harrisburg, Pa., manufacturer of tin plate and agate ware, which has been closed for some time, has reopened and officials report that sufficient orders are now on hand to insure operation for several months.

Boston

More Pig Iron Inquiry Than Noted in Weeks, but Trade Doubts Its Sincerity

BOSTON, Jan. 8.—More inquiry for pig iron is noted than in several weeks, ranging from 1000 to 2000 tons in one instance, down to 100-ton lots. The trade, however, doubts the sincerity of a large percentage of the inquiries, belief being general that much of it is for inventory purposes, especially in those cases where deliveries are not specified. How much business will develop, therefore, is problematical. Actual sales made since last reports are small, the largest reported being 200 tons of eastern Pennsylvania to a Connecticut foundry, half No. 2X and half No. 2 plain, and for the most part ear lots. Inquiries for second quarter iron are reported, but tonnages involved are unimportant and furnaces approached are uninterested. A majority of the important New England manufacturers are still involved in inventories and holding outside work down to a minimum. Jobbing foundries, therefore, are operating on a hand-to-mouth basis. A majority of the large industrial foundries are less active than in December. Pig iron interests, therefore, do not look for much activity in the market until after the fifteenth of the month. Prices, on the surface, are steady.

We quote delivered prices on the basis of the latest reported sales as follows, having added \$3.65 freight from eastern Pennsylvania, \$4.91 from Buffalo, \$5.92 from Virginia, and \$9.60 from Alabama:

East. Penn., sil. 2.25 to 2.75.....	\$27.15
East. Penn., sil. 1.75 to 2.25.....	26.65
Buffalo, sil. 2.25 to 2.75.....	\$27.41 to 28.41
Buffalo, sil. 1.75 to 2.25.....	26.91 to 27.91
Virginia, sil. 2.25 to 2.75.....	30.42 to 32.42
Virginia, sil. 1.75 to 2.25.....	29.92 to 31.92
Alabama, sil. 2.25 to 2.75.....	31.10
Alabama, sil. 1.75 to 2.25.....	30.60

Finished Material.—The improvement in the demand for finished material noted in other sections of the country has not hit New England to any marked degree. Several important structural jobs are hanging fire, but are slow in maturing. The Statler Hotel project has been definitely put over until April 1 or later. Going business in shapes is confined to small tonnages, and while 2.50c. Pittsburgh is openly quoted, 2.40c. has been done. Most passing plate business is on a 2.40c. Pittsburgh base, with an occasional lot at 2.35c. Prices on bars are more firmly maintained than on other material, with the demand slightly better. The New York Central Railroad has ordered 18 75-ft. steel passenger cars from the Osgood Bradley Car Co., Worcester, Mass. The Rubwood Wheel Corporation, Monson, Mass., has booked an order for 14,000 semi-steel automobile wheels.

Coke.—Shipments on contracts for by-product foundry coke, which dropped to small proportions with the advent of the new year, are increasing more because of uneasiness on the part of foundries over supplies, now that snow and ice storms have been experienced, than because of any appreciable increase in the melt of iron. For such fuel, both the New England Coal & Coke Co. and the Providence Gas Co. ask \$12.50 delivered in New England. Crushed coke supplies in the hands of oven owners are unusually large for this season, due to the heretofore open winter. Coke makers, therefore, are giving more attention to the crushed than to the foundry coke situation. A small amount of belated first by-product foundry coke contracting business was placed the next week.

Old Material.—Fundamental conditions in the market are sounder. Passing business is only fair, to be sure, but inquiry is larger and more diversified, indicating greater activity ahead. Stocks of material in first and dealers' hands are no more than comfortable. Prices, generally, tend upward. Exceptions are found in shafting and street car axles, which are 50c. lower, the recent appreciation evidently being too rapid. Heavy melting steel sales the past week ran well up into four figures. For Worcester, Mass., and eastern Pennsylvania delivery, \$13.50 a ton on cars and higher, an advance of 25c. was paid. For West Virginia several hundred tons brought \$12.80 to \$13. As high as \$10.50

on cars was paid for steel turnings for eastern Pennsylvania, but the best most dealers can do is \$9.50 to \$10. Stove plate for eastern Pennsylvania delivery fetched \$12 to \$12.50 on cars. Mixed borings and turnings are in good demand, but few are coming on the market. Additional small tonnages of No. 1 machinery cast have been taken by New England foundries at \$22 delivered, and textile at \$23.

The following prices are for gross ton lots delivered consuming points:

No. 1 machinery cast.....	\$22.00 to \$23.00
No. 2 machinery cast.....	20.00 to 21.00
Stove plates.....	16.00 to 16.50
Railroad malleable.....	18.00 to 18.50

The following prices are offered per gross ton lots f.o.b. Boston rate shipping points:

No. 1 heavy melting steel.....	\$13.50 to \$14.00
No. 1 railroad wrought.....	14.50 to 15.00
No. 1 yard wrought.....	12.50 to 13.00
Wrought pipe (1-in. in diam., over 2 ft. long).....	12.00 to 12.25
Machine shop turnings.....	9.50 to 10.00
Cast iron borings, chemical.....	11.25 to 11.75
Cast iron borings, rolling mill.....	9.50 to 10.00
Blast furnace borings and turnings.....	9.00 to 9.50
Forged scrap and bundled skeleton.....	9.50 to 10.00
Shafting.....	17.00 to 17.50
Street car axles.....	17.00 to 17.50
Rails for rolling.....	14.00 to 14.50

St. Louis

Activity in Pig Iron Followed by Advance in Price by Local Company

ST. LOUIS, Jan. 8.—The St. Louis Coke & Iron Co. began the new year with the sale of 9500 tons of basic iron for prompt shipment to an East Side melter; 1300 tons of foundry iron for second quarter delivery to an East Side manufacturer, 700 tons of foundry iron to a stove manufacturer in St. Louis and 500 tons of foundry in lots of carloads up to 100 tons. This activity and the fact that this concern is pretty well sold up for first quarter make caused the company to advance its price \$1 a ton to \$25 to \$26, Granite City. Some requests are being made of the local maker for shipments in anticipation of contracts. A Southern maker sold 350 tons. Little other business was done during the week, and there are no new inquiries of consequence. The market is firm at \$23.50, Chicago, for Northern and \$21 to \$22, Birmingham, for Southern make. The Federal Reserve Bank of St. Louis reports that while new business has been slow in arriving, old bookings are enabling mills and foundries to run at from 65 to 85 per cent of capacity, and some specialty manufacturers, notably of castings for railroad cars and heating apparatus, are working on full schedule. Plants specializing in gray castings report no change in the status of their business, the report adds.

We quote delivered consumers' yards, St. Louis, as follows, having added to furnace prices \$2.16 freight from Chicago, \$3.28 from Birmingham (rail and water), \$5.17 from Birmingham, all rail, and \$1 cents average switching charge from Granite City:

Northern fdy., sil. 1.75 to 2.25.....	\$25.16 to \$25.66
Northern malleable, sil. 1.75 to 2.25.....	25.16 to 25.66
Basic.....	25.16 to 25.66
Southern fdy., sil. 1.75 to 2.25 (rail).....	26.17

Coke.—A drop in temperature to below zero brought out a spirited demand for coke both for domestic and industrial uses. Supplies in dealers' yards have been reduced, and they have been buying to replenish their stock.

Finished Iron and Steel.—The new year began with one of the most attractive inquiries for tie plates ever issued by a railroad centering for St. Louis. It was issued by the Missouri Pacific Railway and is for 2,500,000 tie plates, involving about 10,000 tons. The United (street) Railways of St. Louis is in the market for 1000 tons of 100-lb. rails and 500 tons of 80-lb. rails and the necessary fastenings. The order for 14,000 tons of rails for the International & Great Northern Railway went to the Tennessee Coal, Iron & Railroad Co., in competition with Eastern mills which had expected to get the order because of favorable water rates. The inquiry of consequence for galvanized

sheets came from a St. Louis manufacturer of buckets, and was for 500 tons of galvanized tight coated sheets. A few smaller jobbers in the St. Louis territory have sent in orders to replenish stocks, but there is no buying of consequence from this source. Fabricators are busy on structural jobs, but no new business has developed.

For stock out of warehouse we quote: Soft steel bars, 3.35c. per lb.; iron bars, 3.35c.; structural shapes, 3.45c.; tank plates, 3.45c.; No. 10 blue annealed sheets, 4.10c.; No. 28 black sheets, cold-rolled, one pass, 4.85c.; cold drawn rounds, shafting and screw stock, 4.70c.; structural rivets, 4.15c.; boiler rivets, 4.35c.; tank rivets, $\frac{1}{2}$ -in. and smaller, 50-5 per cent off list; machine bolts, 45-5 per cent; carriage bolts, 40-5 per cent; lag screws, 50-5 per cent; hot pressed nuts, squares or hexagon blank, \$2.50, and tapped, \$2.50 off list.

Old Material.—The demand for cast scrap, especially No. 1 machinery cast, was the outstanding feature of the week in old material. There have been inquiries, too, from rolling mills and smelters in the district, but not much actual business was done. A peculiar feature of the market is that at present prices, car wheels bring better prices if broken up and sold as cast scrap than if sold as wheels. New railroad lists issued during the week include: Atchison, Topeka & Santa Fe, 3800 tons; International & Great Northern, 3300 tons, and Chicago & Eastern Illinois, 600 tons. Railroads are far behind in the shipment of material against lists already sold, some lines owing material sold in August.

Per Gross Ton	
Iron rails	\$18.00 to \$18.50
Rails for rolling	19.50 to 20.00
Steel rails, less than 3 ft.	20.00 to 20.50
Relaying rails, 60 lb. and under	25.00 to 26.00
Relaying rails, 70 and over	32.50 to 33.50
Cast iron car wheels	19.50 to 20.00
Heavy melting steel	17.50 to 18.00
Heavy shoveling steel	17.00 to 17.50
Frogs, switches and guards cut apart	18.00 to 18.50
Railroad springs	20.00 to 20.50
Heavy axles and tire turnings	14.00 to 14.50

Per Net Ton	
Steel angle bars	16.00 to 16.50
Steel car axles	19.50 to 20.00
Iron car axles	26.00 to 26.50
Wrought iron bars and transoms	20.00 to 26.50
No. 1 railroad wrought	15.00 to 15.50
No. 2 railroad wrought	15.50 to 16.00
Cast iron borings	11.50 to 12.00
No. 1 busheling	15.00 to 15.50
No. 1 railroad cast	18.50 to 19.00
No. 1 machinery cast	19.00 to 19.50
Railroad malleable	17.00 to 17.50
Machine shop turnings	10.50 to 11.00
Champion bundled sheets	10.00 to 10.50

Birmingham

Cold Weather Interferes with Some Operations—Pig Iron Sales Light

BIRMINGHAM, ALA., Jan. 8.—Delivery has started from blast furnaces in the Birmingham district on contracts received several weeks ago. Sales at present are hand to mouth, with some of the melters a little handicapped for the past few days by the extremely cold weather, the common labor not turning out as well as expected. This was felt more in the sanitary pipe plants and smaller foundries. The negotiations said to be under way a fortnight ago have not been consummated, the expectations being that between 25,000 and 50,000 tons of pig iron would be sold to the one consumer, a large cast iron pipe company. The makers of gas and water pipe have business in hand and in sight which promises to warrant capacity operation of shops through the first three quarters of the year. Two of the more active furnace interests of the Birmingham district are out of the market on some grades and are not pushing efforts for business. Two smaller furnace interests are not seeking any business at all under \$22 per ton, No. 2 foundry. Quotations are ranging between \$21 and \$21.50 per ton, No. 2 foundry, the small lot purchasers in the home territory paying the latter price.

We quote per gross ton f.o.b. Birmingham district furnace as follows:

Foundry, silicon 1.75 to 2.25	\$21.00 to \$21.50
Basic	21.00 to 21.50
Charcoal, warm blast	33.00

Cast Iron Pipe.—All three of the large-sized pipe makers in the Birmingham district continue receiving lettings, delivery covering three to four months. The American Cast Iron Pipe Co. booked more business from California the past week, Santa Barbara taking 646 tons and Palms 235. This company also sold Madison, Wis., 146 tons and Miami, Fla., 200 tons. The winter buying of cast iron pipe is coming up to expectations and problems of delivery in the future may be avoided, though a heavy influx of business is looked for in early spring. There is not much stock on hand, hence the probable make must be kept steady. Sanitary pipe orders have been fairly active of late. Every effort is being made to cover contracts as quickly as possible. These interests carry but a short stock, curtailing production as demand lags. The extreme cold weather of the past few days has affected the steady operations in this industry.

4-in. water, \$51; 6-in., \$47; larger sizes, \$46; 4-in. gas, \$56; 6-in., \$52; standard sanitary pipe, \$55; heavy gage, \$45.

Coke.—The slight improvement in the Southern coke market noted recently has not given warrant for any improvement in the production. The plans of curtailment in make are still being maintained. Quotations for coke in this section range between \$5 and \$6.50 per ton. The campaign to introduce by-product, carefully prepared coke for domestic fuel has had a little effect on the general market. Foundries are requiring the greater portion of the coke production.

Old Material.—The scrap iron and steel market in the South is showing a little more life and prospects are bright. Inquiries have been received from St. Louis for certain of the old material products. Local melters have taken on some No. 1 cast, but dealers in old material evince no intent to seek long contracts, satisfying themselves with quick sales. Heavy melting steel is dragging at a low quotation.

We quote per gross ton f.o.b. Birmingham district yards, nominal prices, as follows:

Cast iron borings, chemical	\$16.00
Heavy melting steel	\$13.00 to 14.00
Railroad wrought	12.00 to 13.00
Steel axles	19.00 to 20.00
Iron axles	20.00
Steel rails	12.00 to 13.00
No. 1 cast	19.00 to 20.00
Tram car wheels	18.00 to 19.00
Car wheels	13.00 to 14.00
Stove plate	17.00 to 17.50
Machine shop turnings	6.00
Cast iron borings	8.00

Buffalo

Limited Inquiry for Pig Iron—Old Material Prices Advanced

BUFFALO, Jan. 8.—The new year is not sufficiently advanced to have developed the expected demand but a number of price feelers are out and are expected to reach the buying stage. Inquiry has been slow and scattered. One inquiry for 1000 tons from a New England melter engaged producers but is not expected to be placed here. Such other requests for prices were mainly for carloads and slightly above that figure. Prices are firm, and while efforts are being made by furnaces having satisfactory backlog, to maintain differentials of \$1 on higher silicones, there is no difficulty in placing any sized order at \$22.50 for silicon 1.75 to 2.25, with 50c. differentials for higher silicon. In several offices inquiries touching on second quarter delivery have been made but there is no disposition on the part of Buffalo producers to commit themselves so far ahead. The possibility of a bituminous strike in April is probably the principal factor in holding back quotations for this period.

We quote f.o.b. gross ton, Buffalo, as follows:

No. 1 foundry, sil. 2.75 to 3.25	\$23.00 to \$23.50
No. 2 foundry, sil. 2.25 to 2.75	22.50 to 23.00
No. 2 plain, sil. 1.75 to 2.25	22.00 to 22.50
Basic	22.00
Malleable	22.00
Lake Superior charcoal	29.25

Finished Iron and Steel.—Price cutting which marked quotations on sheets late in the year just closed are no longer in evidence. December closed with a higher

average of business than was expected. There is nothing out of the ordinary in demand for bars and shapes; several attractive structural jobs are pending in the district. Two Rochester jobs on which bids will be closed this week involve 1000 tons.

We quote warehouse prices Buffalo as follows: Structural shapes, 3.65c.; plates, 3.65c.; soft steel bars, 3.55c.; hoops, 4.65c.; bands, 4.35c.; blue annealed sheets, No. 10 gage, 4.30c.; galvanized steel sheets, No. 28 gage, 6.10c.; black sheets, No. 28 gage, 5c.; cold rolled round shafting, 4.45c.

Old Material.—Prices are stronger; a reflection of conditions outside the district, particularly in the Valley and Youngstown. Buffalo dealers are offered \$20.50 for heavy melting steel delivered to Valley points, \$16 for machine shop turnings and \$16.50 for cast iron borings. Local dealers are holding fast to prices and refuse offers of consumers here to sell heavy melting steel at prices mills are willing to pay. Some sales of cast scrap have been made at \$20 and \$20.50 but the aggregate is not large.

We quote f.o.b., gross ton, Buffalo, as follows:

Heavy melting steel.....	\$18.00 to \$19.00
Low phos., 0.04 and under.....	21.50 to 22.00
No. 1 railroad wrought.....	14.50 to 15.00
Car wheels	19.00 to 20.00
Machine shop turnings.....	13.50 to 14.00
Cast iron borings.....	13.50 to 14.00
No. 1 busheling.....	15.00 to 16.00
Stove plate	17.00 to 17.25
Grate bars	17.00 to 17.50
Bundled sheet stampings.....	12.00 to 13.00
Hydraulic compressed	15.50 to 16.50
Railroad malleable	20.00 to 21.00
No. 1 machinery cast.....	20.00 to 20.50

Cincinnati

Pig Iron Market Has Not Recovered from Holiday Quiet

CINCINNATI, Jan. 7.—The holiday last week undoubtedly had adverse effect on the pig iron market, for little interest was shown by the trade. The largest sale reported was of 1300 tons of Southern iron to a melter in this district. Another of 1000 tons was also reported. The first one was made on the basis of \$21, Birmingham, but reports on the latter are that the tonnage was placed with a broker at \$20.50, base. The market is generally considered to be \$21, though in the Southern States sales have been made at \$22 for small tonnages. In the North, there is little activity, and prices rule about the same as last week. Some small orders were booked at \$22.50, Ironton, but in competitive districts this price was beaten by Valley furnaces. One sale of 500 tons was made to a large melter, and one of 500 tons of ferrosilicon also was reported. The only inquiry of importance is for 400 tons of foundry from a central Ohio melter. Basic, Bessemer and silvers are inactive, with prices steady.

Based on freight rates of \$4.05 from Birmingham and \$2.27 from Ironton we quote f.o.b. Cincinnati:
Southern coke, sll. 1.75 to 2.25 (base).....\$25.05
Southern coke, sll. 2.25 to 2.75 (No. 2 soft) 25.55
Ohio silvery, 8 per cent.....34.77
Southern Ohio coke, sll. 1.75 to 2.25 (No. 2).....24.77
Basic Northern.....24.77
Malleable

Sheets and Tin Plate.—Orders were more numerous, and at the full schedules, though reports still are current of price shading in blue annealed and black sheets. Tin plate is strong, and numerous inquiries are current from manufacturers who have not entirely covered for first half requirements.

Reinforcing Bars.—While the bulk of the business runs to small tonnages, there are a number of large projects about ready to break, and mills express satisfaction with prospects for business. Prices are firming. The range today in this market is 2.20c. to 2.40c. for rerolled and new billet stock respectively.

Structural Activity.—A number of fair-sized awards, with some good inquiries, are reported. Indications point to a lot of activity in the building industry this winter and spring. Railroads are in the market for bridges, and several shop projects are on tap. The Ford Motor Co. has placed contracts for assembling plants at Memphis, Charlotte and Jacksonville. The Ford plant at Louisville will likely be awarded this week.

Warehouse Business.—Jobbers report the customary let-up during the inventory period. There has been no change of prices.

Cincinnati jobbers quote: Iron and steel bars, 3.50c.; reinforcing bars, 3.60c.; hoops, 4.55c.; bands, 4.25c.; shapes, 3.60c.; plates, 3.60c.; cold-rolled rounds, 4.25c.; cold-rolled flats, squares and hexagons, 4.75c.; No. 10 blue annealed sheets, 4.10c.; No. 28 black sheets, 4.80c.; No. 28 galvanized sheets, 5.85c.; No. 9 annealed wire, \$3.60 per 100 lb.; common wire nails, \$3.50 per keg base; cement coated nails, \$3.30 per keg.

Finished Materials.—There was a perceptible slowing up in the number of orders placed during the past week, but this was nothing unusual for holiday week. On cold-finished materials, contracts and specifications have been numerous. A number of fair-sized inquiries for plates and shapes are current, and this business will likely be placed this week. Wire products are in better demand. The Big Four Railroad took bids on its first quarter requirements of miscellaneous items, chief interest in which centered on plate prices. Two mills quoted the equivalent of 2.40c., Pittsburgh, but the larger independents and the leading interests maintained 2.50c. On wire mills, a \$3.10 Cleveland base was maintained by all bidders.

Coke.—Though current orders are light, foundries are urging immediate shipment on contracts, and requests to trace cars are numerous. Colder weather has caused activity in domestic grades. Prices are soft, by-product domestic fuel having been cut \$2 a ton.

Connellsville furnace, \$4.00; foundry, \$5.00; New River foundry, \$10.00 to \$11.00; Wise County furnace, \$4.75; foundry, \$5.75; by-product foundry, \$8.00, Connellsville basis.

Old Material.—There is little activity locally in scrap, the only sale of consequence being a small tonnage of heavy melting steel to a steel interest at \$19, delivered. Dealers, however, are actively buying against an expected demand from this and other districts, and prices continue to advance.

We quote dealers' buying prices, f.o.b. cars Cincinnati:

	Per Gross Ton
Bundled sheets	\$12.00 to \$12.50
Iron rails	16.00 to 16.50
Relaying rails, 50 lb. and up.....	29.50 to 30.00
Rails for rolling	16.00 to 16.50
Heavy melting steel	16.00 to 16.50
Steel rails for melting.....	15.00 to 15.50
Car wheels	15.50 to 16.00

	Per Net Ton
No. 1 railroad wrought.....	13.50 to 14.00
Cast borings	11.50 to 12.00
Steel turnings	10.50 to 11.00
Railroad cast	16.50 to 17.00
No. 1 machinery cast	19.50 to 20.00
Burnt scrap	13.00 to 13.50
Iron axles	24.00
Locomotive tires (smooth inside)	15.50 to 16.00
Pipes and flues	10.50 to 11.00

Cleveland

Increased Buying of Steel, with Prices Generally Firmer

CLEVELAND, Jan. 8.—The volume of general buying of nearly all lines of steel has increased now that consumers are getting through with their inventories. Manufacturing consumers are buying freely to replace stocks and in larger quantities than they did the latter part of the year. The demand for steel bars is particularly active. Some additional business in first quarter contracts is coming out and mills are getting good specifications on contracts placed in December, particularly from the automotive industry. Prices have firmed up on lines that have been irregular. The demand for plates has increased with that for other products and mills are holding closer to the 2.50c. price, although 2.40c. has not disappeared. In structural lines, two or three new inquiries have come out for building work involving 10,000 tons in this territory and considerable activity is reported in the Detroit territory. The Ford Motor Co. has placed 9000 tons with the McClintic-Marshall Co. for two factory buildings in Detroit, one for an upset department and the other for

a pressed steel department. The Baldwin Reservoir filtration plant, Cleveland, requiring 916 tons, has been placed with T. H. Brooks & Co. An inquiry has come out for the Buhl Building, Detroit, requiring 4000 tons. The 5000 tons of steel required for the lake freight boat placed with the Great Lakes Engineering Works, Detroit, by Herbert K. Oakes, will be supplied by the Jones & Laughlin Steel Corporation. It is reported that the lake boat for which Pickands, Mather & Co. recently sent out an inquiry will be built by the Great Lakes Engineering Works, although the contract has not been definitely placed. This will require 5000 tons of steel. Ohio shops have an inquiry out for 1500 tons of plates for tanks on which they are figuring. The ore handling equipment ordered by the Steel Corporation for its Conneaut docks will require 600 tons of steel. New demand for hot and cold-rolled strip steel has fallen off following the recent buying by the automotive industry, but mills are comfortably filled for the first quarter and are getting good specifications.

Jobbers quote steel bars, 3.36c.; plates and structural shapes, 3.46c.; No. 28 black sheets, 4.40c. to 4.65c.; No. 28 galvanized sheets, 5.60c. to 5.80c.; No. 10 blue annealed sheets, 3.60c. to 4c.; cold rolled rounds, 3.90c.; flats, squares and hexagons, 4.40c.; hoops and bands, 1 in. and wider and 20 gage or heavier, 4.16c.; narrower than 1 in. or lighter than No. 20 gage, 4.66c.; No. 9 annealed wire, \$3.50 per 100 lb.; No. 9 galvanized wire, \$3.95 per 100 lb.; common wire nails, \$3.69 base per 100 lb.

Pig Iron.—The market has become somewhat more active now that the holiday season is over, and there is an increase in shipping orders. Some foundries held back on shipments and many allowed their stocks to run very low before inventory time. As most consumers are under cover, not a great deal of activity is expected until a buying movement gets under way for the second quarter. Demand is largely from the automobile industry in the Michigan and Indiana territories. One lake furnace during the week sold 10,000 tons, including one lot of 6000 tons of foundry and malleable iron to be used mostly for automobile work, and has pending several inquiries aggregating 10,000 tons. The market is dull in this immediate territory, although a few local inquiries have come out for small lots. One weak spot has developed in the market due to the fact that a northern Ohio furnace has offered price concessions for business outside its immediate territory and at points where it has a disadvantage of freight rate. This producer has quoted \$21.50 base on Ohio inquiries and on an Erie, Pa., inquiry for 800 tons went still lower with a \$21.50 price for 2.25 to 2.75 silicon iron. Locally the market is firm and unchanged at \$22.50 at furnace for foundry and malleable iron for Cleveland delivery and at \$22 for delivery in the nearby territory. In the Michigan and Indiana territory, the price ranges from \$22.50 to \$23, most of the week's business being placed at a higher price. The Hanna Furnace Co. will blow in its Dover, Ohio, furnace this week and the Otis Steel Co. will place its second Cleveland stack in blast this month.

Quotations below, except on basic and low phosphorus iron, are delivered Cleveland, and for local iron include a 50c. switching charge. Ohio silvery and Southern iron prices are based on a \$3.02 freight rate from Jackson and \$6 rate from Birmingham:

Basic, Valley furnace	\$21.00
Northern No. 2 fdy., sil. 1.75 to 2.25	23.00
Southern fdy., sil. 1.75 to 2.25...	27.00
Malleable	23.00
Ohio silvery, 8 per cent.	35.52
Standard low phos., Valley furnace	\$29.00 to 30.00

Iron Ore.—Dock shipments of ore were fairly heavy in December. During the month 841,790 gross tons were shipped from Lake Erie docks as compared with 685,778 tons during the corresponding month last year. The balance on docks Jan. 1 was 7,981,432 as compared with 9,233,613 tons on Jan. 1, 1923. Receipts at Lake Erie ports during December were 66,191 tons and for the season 43,666,071 tons. Shipments for the season until Jan. 1 were 33,503,976 tons as compared with 21,781,251 tons during 1922.

Bolts, Nuts and Rivets.—Considerable business in first quarter contracts was booked during the week and

most consumers are now under cover for that delivery. Local makers are quoting cold-pressed nuts at 4.25c. off list for car lots but are holding to the regular discount of 4c. for smaller lots. Good specifications are reported for rivets but largely on fourth quarter contracts from consumers who had not previously taken all the tonnage covered by these contracts. Makers are still entering first quarter contracts at the regular prices.

Semi-Finished Steel.—The market has become more active. A Canton consumer has purchased 1000 tons of sheet bars for early shipment and two other lots for early delivery to northern Ohio consumers, aggregating 3000 tons, were placed during the week with a Youngstown district mill. A Cleveland consumer is inquiring for 2000 tons of billets for prompt shipment. Some inquiry is coming for sheet bars from consumers who have been holding off with the hope of getting lower than the \$42.50 price, which is firmly held. One Valley district mill is sold up on sheet bars for two months and has withdrawn from the market. Billets are firmer and some of the mills seem inclined not to quote these below the sheet bar price.

Sheets.—The demand for sheets continues active, although the volume of business is not so heavy as two or three weeks ago, when the automobile companies were placing contracts. Considerable business was placed during the week by consumers in various industries. Some are placing first quarter contracts and others are buying for less extended periods. Sheet prices are firmer and regular quotations now appear to be well maintained except on black sheets, which can still be bought at 3.75c. for immediate specifications.

Old Material.—A local mill during the week purchased about 12,000 tons of machine shop turnings and 6000 tons of heavy melting steel, paying \$14.50 for the former and \$18.50 for the latter. The same company during the previous week purchased turnings at \$14. Further sales of heavy melting steel have been made at other Ohio points at \$20. A Canton mill was among the buyers of this grade. The market is very firm. Heavy melting steel, borings, turnings, compressed steel and busheling have advanced \$1 a ton and most other grades 50c. With the present narrow spread between scrap and pig iron a large local consumer announces that it will cut down materially the percentage of scrap used in its open-hearth furnaces. It has developed that under the terms of the scrap contract recently entered into between the New York Central Railroad and the McKinney Steel Co. the railroad will ship all its miscellaneous unsorted scrap to the McKinney company which will sort it and buy the steel scrap which will amount to about 90 per cent of the total. The remainder, such as malleable and cast iron, will be sold by the railroad as heretofore. The railroad will also sell its rails, axles and other materials which do not require handling through scrap docks. The price paid by the McKinney company will be based on current quotations in trade papers.

We quote dealers' prices f.o.b. Cleveland per gross ton:

Heavy melting steel	\$17.50 to \$18.00
Rails for rolling	18.25 to 18.75
Rails under 3 ft.	19.50 to 20.00
Low phosphorus melting	20.25 to 20.75
Cast borings	15.00 to 15.50
Machine shop turnings	14.25 to 14.75
Mixed borings and short turnings	15.00 to 15.25
Compressed sheet steel	16.25 to 16.50
Railroad wrought	16.50 to 16.75
Railroad malleable	20.25 to 20.75
Light bundled sheet stampings	13.00 to 13.25
Steel axle turnings	15.50 to 16.00
No. 1 cast	21.50 to 22.50
No. 1 busheling	14.25 to 14.50
Drop forge flashings	13.25 to 13.75
Railroad grate bars	18.50 to 19.00
Stove plate	18.50 to 19.00
Pipes and flues	13.75 to 14.25

Reinforcing Bars.—The volume of inquiry has increased. Competition is very keen and price irregularities continue. Quotations of 2.30c on soft steel bars are being made by jobbers who have stocks bought at below prevailing mill prices. On rail steel bars, the common quotation is still 2.10c. The Bourne-Fuller Co. has taken 350 tons for the Brotherhood of Locomotive Engineers' Building and 150 tons for the German Con-

solidated News Co. Building, Cleveland, and the Massillon Reinforcing Bar Co. 150 tons for the Private Investment Co. Building, Cleveland.

Coke.—The market is rather quiet and prices are unchanged. Some contracts are being placed for foundry coke for the first quarter but mostly by consumers who use grades on which there is little or no spread between contract and spot shipment prices. Quotations range from \$5 to \$6.50 for standard Connellsville foundry coke for prompt shipment and from \$6.25 to \$6.50 for contracts.

Philadelphia

January Has Brought Considerable Gain in Volume of Steel Business

PHILADELPHIA, Jan. 8.—More steel has been purchased by consumers and jobbers in the Philadelphia district in the first six business days of January than in any single week in several months. The buying has had the same characteristics of that of last month, small orders for early shipment, but there has been more of it. One large independent steel company reports that the aggregate tonnage taken in its Philadelphia office so far this month has passed the total booked in the entire month of December, which month, by the way, brought in the aggregate more tonnage to some steel companies than has been generally estimated. The increase in buying has come from all quarters and has affected nearly all products, though some more than others. The lighter forms of steel—sheets, tin plate, hoops and bands, strips—have been in good demand, and there has been a marked improvement in buying of pipe, bars and structural shapes, especially the last named. Jobbers' orders for rounding out stocks have been of material importance in swelling the total for the month so far. Plates, which have been the dullest of all steel products for some months, have gained slightly and operations of Eastern mills this week, though not good, are better than December operations.

The Pennsylvania Railroad may become an important factor in leading the way to more active steel buying. In addition to 15,000 to 18,000 tons of plates which will be required for 3000 all-steel box car bodies this road is now inquiring for, it is asking for prices on 200,000 to 500,000 tie plates—1200 to 3000 tons; also 100 to 250 tons of railroad spikes, and it has placed an order for 300 to 500 tons of forging billets. From 1500 to 2000 tons of plates, on which shipment was held up some months ago, have been released by the Pennsylvania for the building of locomotives in its own shops, and it is expected that a much larger tonnage of car plates distributed among several mills and suspended in the fall may also be released soon.

Structural activity seems to be increasing in this district. Three projects now pending call for more than 12,000 tons of steel.

The pig iron market continues very dull. Scrap is still on the upward trend.

Pig Iron.—The improvement in the steel trade in the first week of January has not been shared by the pig iron trade, which is very dull. Sales are few and mostly carload or 100-ton lots. Eastern furnaces have sold several thousand tons in the past week, but it has been well scattered. Furnace prices continue firm at \$23, base, but offerings of resale iron at prices equivalent to \$22 and \$22.50, furnace, have been a little disturbing to those who are attempting to keep the market at its present level. The amount of resale iron is believed to be small and it may disappear soon as a market factor. Another disturbing element is the holding up of shipments by some foundries. Requests for suspension were received by several furnaces before the holi-

days, with the explanation that shipping instructions would be given soon after Jan. 1, but thus far most of the suspended tonnage is still being held up. There is no demand for basic and very little for low phosphorus. Prices on the latter range from \$27 for copper free to \$28 for copper bearing at furnace, the lower price on copper free being due to a high freight rate to this district.

The following quotations are, with the exception of those on low phosphorus iron, for delivery at Philadelphia and include freight rates varying from 76 cents to \$1.63 per gross ton:

East. Pa. No. 2 plain, 1.75 to 2.25	
sil.	\$23.76 to \$24.13
East. Pa. No. 2X, 2.25 to 2.75	24.26 to 24.63
sil.	
East. Pa. No. IX	24.76 to 25.13
Virginia No. 2 plain, 1.75 to 2.25	
sil.	29.17 to 30.17
Virginia No. 2X, 2.25 to 2.75	30.17 to 30.67
sil.	
Basic delivery eastern Pa.	23.25 to 23.50
Gray forge	23.00 to 23.50
Malleable	24.25 to 24.50
Standard low phosph. (f.o.b. fur-	
nace)	27.00 to 27.50
Copper bearing low phosph. (f.o.b.	
furnace)	28.00

Ferroalloys.—Domestic makers of ferromanganese report the market firm at \$109, furnace. British ferromanganese remains at \$110, seaboard. There has been substantial buying of manganese ore in the past week.

Semi-Finished Steel.—A little better demand for billets is in evidence. The Pennsylvania Railroad has placed its first quarter requirements of forging billets, 300 to 500 tons. Prices remain at \$40, Pittsburgh, for rerolling quality and at \$45 for forging quality.

Plates.—Eastern plate mills are operating at a slightly increased rate due to a little betterment in business. One large mill is running about 40 per cent this week and some of the smaller mills are equaling or exceeding this rate. Among the orders of the past week were three for oil tanks which totaled about 1000 tons. Two or more mills have profited by the release of locomotive plates by the Pennsylvania Railroad for work to be done in its own shops. These orders have been held up for months, and the reinstatement gives rise to the expectation that several thousand tons of car plates, held up last fall, may also be released. From 15,000 to 18,000 tons of plates will be required for 3000 all-steel box car bodies for which the Pennsylvania Railroad is inquiring. A shipbuilding company is asking for prices on about 1000 tons of steel for two boats on which it is bidding. With occasional lots being sold at 2.35c., Pittsburgh, the plate mills are averaging about 2.40c., Pittsburgh, on current sales. Practically no business except less than carloads is being done at 2.50c.

Structural Material.—The Ford Motor Co. is asking for revised bids on its assembly plant to be built in Philadelphia, requiring 3000 tons, which is below previous estimates. A bank building in Philadelphia and a coal breaker at Lansford, Pa., are being figured, the former requiring 6000 tons and the latter 3300. A good deal of the improvement in demand for structural shapes in the past week has been due to orders from jobbers for rounding out stock. While less is heard of 2.35c. quotations on plain material, it is also true that business is being negotiated less frequently at the top of the market, 2.50c., Pittsburgh, most of the current orders being taken at 2.40c. Operations at some of the Eastern mills are on the up-grade.

Bars.—While the demand for bars has not improved this month to the same extent as some other products, there has been a better demand than that of last month. Mill prices are firm, and the only weakness appears in concrete reinforcing bars out of stock, which are being offered at 2.40c. or less, whereas the differential over the mill price is usually several dollars a ton. Bar iron remains at 2.30c., Pittsburgh, from Eastern mills and orders are coming in more freely.

Sheets.—Contracts and specific orders for blue annealed sheets have been received in good volume the past week by the leading Eastern maker. The price is firmly maintained at 3c., Pittsburgh. Black and galvanized are not so easily obtained at concessions.

Warehouse Business.—Demand for steel out of stock is at a fairly good rate, encouraging jobbers to buy from mills for replacements on a more liberal basis.

Prices are without change, and for local delivery are as follows:

Soft steel bars and small shapes, 3.47c.; iron bars (except bands), 3.47c.; round edge iron, 3.75c.; round edge steel, iron finished, $1\frac{1}{2} \times \frac{1}{4}$ in., 3.75c.; round edge steel planished, 4.55c.; tank steel plates, $\frac{1}{4}$ in. and heavier, 3.57c.; tank steel plates, $\frac{1}{8}$ in., 3.82c.; blue annealed steel sheets, No. 10 gage, 4.10c.; black sheets, No. 28 gage, 5.15c.; galvanized sheets, No. 28 gage, 6.25c.; square twisted and deformed steel bars, 3.57c.; structural shapes, 3.57c.; diamond pattern plates, $\frac{1}{4}$ -in., 5.40c.; $\frac{1}{8}$ -in., 5.60c.; spring steel, 5c.; round cold-rolled steel, 4.35c.; squares and hexagons, cold-rolled steel, 4.85c.; steel hoops, 1 in. and wider, No. 20 gage and heavier, 4.27c.; narrower than 1 in., all gages, 4.77c.; steel bands, No. 12 gage to $\frac{1}{8}$ -in., inclusive, 4.27c.; rails, 3.47c.; tool steel, 8.50c.; Norway iron, 7c.

Old Material.—The Eastern scrap market bore evidence of a set-back the middle of last week, but a day or two later word was received from Pittsburgh that the Carnegie Steel Co. had made another purchase of steel scrap, this time for its Duquesne works at \$20, delivered, and interest here was revived. In the ensuing few days the market has shown a further upward trend, with advances of 50c. or \$1 a ton on many grades. High prices paid for the various grades on the Pennsylvania Railroad list, sold a few days ago, also have had a strengthening effect. In many instances consumers were awarded material at prices higher than dealers and brokers had bid. Heavy melting steel may be quoted at \$17.50 to \$18, delivered to consumers in eastern Pennsylvania, the former price representing offers by brokers on old orders and the latter price has been paid by at least one mill. A Burnham, Pa., plant is in the market for 2000 tons of couplers and knuckles and rolled steel wheels.

We quote for delivery at consuming points in this district as follows:

No. 1 heavy melting steel.....	\$17.50 to \$18.00
Scrap rails.....	17.50 to 18.00
Steel rails for rolling.....	19.00 to 19.50
No. 1 low phosph., heavy 0.04 and under.....	22.00 to 23.00
Couplers and knuckles.....	22.00 to 23.00
Cast-iron car wheels.....	20.00 to 21.00
Rolled steel wheels.....	22.00 to 23.00
No. 1 railroad wrought.....	20.00 to 20.50
No. 1 yard wrought.....	18.00 to 18.50
No. 1 forge fire.....	15.50 to 16.00
Bundled sheets (for steel works).....	15.00 to 15.50
Mixed borings and turnings (for blast furnace use).....	12.50 to 13.00
Machine shop turnings (for steel works use).....	15.00 to 15.50
Machine shop turnings (for rolling mill use).....	15.50 to 16.00
Heavy axle turnings (or equivalent).....	17.00 to 18.00
Cast borings (for steel works and rolling mills).....	14.50 to 15.00
Cast borings (for chemical plants).....	18.00 to 18.50
No. 1 cast.....	20.50 to 21.00
Heavy breakable cast (for steel plants).....	18.00 to 18.50
Railroad grate bars.....	17.00 to 17.50
Stove plate (for steel plant use).....	17.00 to 17.50
Railroad malleable.....	18.50 to 19.00
Wrought iron and soft steel pipes and tubes (new specifications).....	18.00 to 18.50
Shafting.....	25.00 to 26.00
Steel axles (nominal).....	23.00 to 24.00

Cast Iron Pipe, November, 1923

The Department of Commerce announces statistics on production, shipments, orders, and stock of cast iron pipe for November, 1923. This report includes returns from 12 companies and is confined to bell and spigot pressure pipe exclusively. Following is the total tonnage for each of the principal items of the industry:

Cast iron pipe produced during the month (tons).....	80,945
Cast iron pipe shipped during the month (tons).....	73,080
Orders for cast iron pipe specified to be shipped from stock (tons).....	18,238
Orders for cast iron pipe specified to be made (tons).....	118,995
Orders for cast iron pipe not specified as to size (tons).....	5,197

Street Railway and Interurban Cars Bought

Orders for interurban, subway and street railways cars during 1923 totaled 2672 cars, of which 2199 were for street railways and 473 for interurban and subway lines. Deliveries of these types of cars up to Dec. 1 were 2179 street railway cars and 351 interurban and subway.

More Activity at the Mahoning Valley Plants

YOUNGSTOWN, Jan. 8.—Mahoning Valley steel manufacturers generally report the receipt of considerable business for first quarter delivery. A number of makers, including the Trumbull Steel Co. and the Sharon Steel Hoop Co., Sharon, Pa., are virtually sold up for the quarter.

Operations are also broadening. Of 120 sheet and jobbing mills in the Valley 80 were scheduled at the beginning of the week, while independent bar mill operation is approaching 75 to 80 per cent. The Republic Iron & Steel Co. is now producing for the first time coke from its new by-product coke oven battery, recently completed.

Valley Scrap Market

YOUNGSTOWN, Jan. 8.—Heavy melting scrap is selling in this district at or above the price of basic pig iron, a somewhat unusual situation. Heavy melting is quotable at \$21 to \$21.50, comparing with a \$21 quotation on basic iron. Ordinarily heavy melting scrap sells from \$2 to \$4 below iron. Advance in scrap prices was precipitated by the purchase by the Carnegie Steel Co. in the Pittsburgh district.

Scrap dealers say the present price situation cannot continue long, that either iron will advance or that scrap will recede until the normal differential is restored. Independent steel interests have purchased scrap sparingly, but dealers have recently been obliged to pay up to \$21 for heavy melting to supply customers on contracts at lower levels.

Annual Dinner of Carnegie Steel Co.

The annual dinner of the operating and sales officials of the Carnegie Steel Co. was held at the William Penn Hotel, Pittsburgh, Saturday evening, Jan. 5. Homer D. Williams, president of the company, was toastmaster and the addresses were on the general subject of "King Cotton." A motion picture depicting the manufacture of cotton ties and the picking, ginning and baling of cotton was shown. J. Lamont Hughes, general superintendent Ohio works, Youngstown, spoke on "Cotton Tie Manufacture," William B. Weston on "Cotton, Its Distribution and Use," and Clarence L. Gillespie, sales representative, Dallas office, on "Texas and the Southwest."

Inland Buys Milwaukee Sheet Mill

After negotiations lasting several months, the Inland Steel Co., Chicago, has purchased the Milwaukee Rolling Mill Co., Milwaukee. The Milwaukee plant has 10 hot sheet mills with an annual capacity of 60,000 tons. The Inland company sheet plant at Indiana Harbor embraces 16 hot mills and two jobbing mills with a capacity of 130,000 tons per year. The Milwaukee acquisition, therefore, will raise the company's annual capacity to 190,000 tons.

Wages of Puddlers Reduced

Wages of puddlers were reduced from \$13.38 to \$13.13 a ton and those of bar iron finishers about 1 per cent as a result of the recent bi-monthly wage settlement at Youngstown between the Western Bar Iron and Amalgamated associations.

Examination of sales sheets showed the average price of shipments the past 60 days was 2.35c. as compared with 2.40c. the previous period and 2.50c. the second preceding period.

The new puddle rate, effective for January-February, compares with the peak rate of \$13.88 for September and October.

MODEL MINING TOWN

Subsidiary of Youngstown Sheet & Tube Co. Highly Praised by Commission

UNIONTOWN, PA., Jan. 7.—Nemacolin, mining site of the Buckeye Coal Co., subsidiary of the Youngstown Sheet & Tube Co., is the model mining community of the United States, according to the report of the United States Coal Commission recently made public.

Following an investigation of 713 representative company-controlled mining communities in the United States as to general living conditions, the commission ranked Nemacolin at 93 per cent, the highest in the nation.

Edenborn plant of the H. C. Frick Coke Co., in the Connellsville coke region, ranks sixth in the report of the commission.

In the commission's investigation, a detailed schedule was followed covering topography and natural location, housing and highways, water supply, sewage and lighting service, sources of food supply, means of intercourse and communication with other communities, educational facilities, churches, hospitals, medical service, recreation and other community resources.

Nemacolin presents a rare study in modern industrial community housing, location, consideration and treatment of employees and means of furthering their welfare. Situated in a difficult natural topography, rated at only 55 per cent by the commission investigators, the founders and engineers of the community site have overcome these natural handicaps in many remarkable ways.

Standing out as the two main individuals responsible for this achievement are James A. Campbell, president of the Youngstown Sheet & Tube Co., and C. M. Lingle, general superintendent of coal mining operations of the company. They have been assisted by a loyal group of engineers, housing experts and workers in meeting the common aim so splendidly achieved. Mr. Lingle has been in active charge of operations at Nemacolin since ground was first broken on what is to be the greatest mining community in the world. What has been accomplished and given official recognition in community achievement, is likewise true in the actual mining development under ground, which still is in progress.

Isolated to a certain extent in its location, although convenient to Pittsburgh, Uniontown and other civic and industrial centers, officials of the Buckeye Coal Co. laid their plans with the purpose of giving Nemacolin a community thoroughly individualistic and complete for happy, contented living of its hundreds of employees. Homes have been erected on a well laid out system, and homes is the proper word, but the "sameness" so often apparent in communities of its kind has been eliminated by the construction of buildings of a similar general appearance, yet distinctive in character and arrangement. The homes are equipped with baths and running water; electricity and gas for lighting and heating purposes, as well as coal for heating; and adequate sewage disposal systems. Construction is of a high type and each house represents an investment of several thousand dollars.

There are many other community features, including the merchandising, detailed study of which was made by the commission's investigators last summer.

How Workers in Coke Region Spend Their Money

UNIONTOWN, PA., Jan. 7.—That workers in the famous Connellsville coke region live much the same and even better than many of their brother workers in other community centers is indicated in the report of the United States Coal Commission on the disbursements of the family income, the first such tabulation in the history of the coke region.

A compilation of statistics showing the disbursement of the family income for 1922, indicates that one-half of 1 per cent of the income was used in the payment of debts; that 2.2 per cent was used for automobiles and maintenance thereof; that 2.6 was expended in payments on homes, 1.3 per cent in bank deposits and 1.5 per cent in other investments.

The largest single item of expenditure, naturally, was for food, totaling 37.5 per cent, while 13.7 per cent of the income went for clothing and dry goods and 3.7 per cent for toilet articles and drugs. Church contributions absorbed 0.90 per cent; while organizations other than labor organizations took 0.10 per cent. Burials, christenings and weddings took eight-tenths of 1 per cent; while gifts of money to relatives, charities and the like absorbed 0.60 per cent.

Automobile Dollar More Potent

Figures and diagrams prepared by the National Automobile Chamber of Commerce, New York, show that the dollar spent for automobiles and supplies buys more today than in 1913. Specifically, the purchaser gets 111c. worth of automobile, 101c. worth of gasoline, and 123c. worth of tires now for each dollar, as compared with similar purchases ten years ago.

Compared with these figures are shown corresponding figures for a considerable variety of purchases in other fields, in which the dollar varies from 45c. for a frame building to 98c. for live stock, with an average of 61.3c. for the cost of living. On the basis of the figures shown, one can today purchase about twice as many tires, for a given outlay, as of the general commodities going into the budget of the average family—this again being a comparison with 1913 prices.

Largest Connellsville Coke Production Since 1918

UNIONTOWN, PA., Jan. 7.—Coke production figures for the year 1923, as compiled by the Connellsville *Courier*, show a total production of 13,114,340 tons, the largest since 1918, with a market value, based on an average of \$5.90 a ton, of \$77,374,606, a figure exceeded by only three other years. The *Courier's* production average and price table covering 10 years follows:

Year	Production	Price	Value
1914.....	37,965	\$2.00	\$28,151,276
1915.....	38,986	1.80	32,258,188
1916.....	38,362	2.58	55,768,615
1917.....	38,110	6.25	111,288,631
1918.....	37,061	7.25	117,004,777
1919.....	35,758	4.70	48,196,808
1920.....	35,678	8.30	89,226,884
1921.....	35,473	4.07	14,539,739
1922.....	35,042	7.15	40,576,250
1923.....	34,611	5.90	77,374,606

Automobiles Lead Manufactured Exports

Automobiles and parts form the largest export item of any manufactures sent from the United States. They occupy sixth place among all commodities exported, being exceeded only by cotton, mineral oils, wheat, tobacco and coal. They are considerably in advance of the other leading manufactured products, of which cotton cloth, iron and steel, and agricultural machinery occupy second, third and fourth places. Figures of the Department of Commerce show exports in the fiscal year ended June 30 of \$132,035,000 in automobiles and parts, an increase of 72 per cent over the previous fiscal year and of 467 per cent over the average of the years 1910 to 1914.

Percival Johnson, president Pulaski Iron Co., Philadelphia, recently elected to the presidency of the Eastern Pig Iron Association, presided for the first time at the meeting held in the Bankers' Trust Building, Jan. 4. Twenty-five members of the association were present at a luncheon at the Hotel Bellevue, following the meeting. Remarks were made by A. I. Findley, editor *THE IRON AGE*.

Prices Finished Iron and Steel f.o.b. Pittsburgh

Carload Lots

Plates

Sheared, tank quality, base, per lb..... 2.50c.

Structural Materials

Beams, channels, etc., base, per lb..... 2.50c.
Sheet piling

Iron and Steel Bars

Soft steel bars, base, per lb..... 2.40c.
Soft steel bars for cold finishing..... \$3 per ton over base
Reinforcing steel bars, base..... 2.40c.
Refined iron bars, base, per lb..... 3.10c. to 3.15c.
Double refined iron bars, base, per lb..... 4.75c.
Stay bolt iron bars, base, per lb..... 7.75c. to 8c.

Hot-Rolled Flats

Hoops, base, per lb..... 3c.
Bands, base, per lb..... 3c.
Strips, base, per lb..... 3c.

Cold-Finished Steel

Bars and shafting, base, per lb..... 3c.
Bars, S. A. E. Series, No. 2100..... 4.75c.
Bars, S. A. E. Series, No. 2300..... 6.25c. to 6.50c.
Bars, S. A. E. Series, No. 3100..... 5.25c. to 5.50c.
Strips, base, per lb..... 5.00c.

Wire Products

Nails, base, per keg..... \$3.00
Galvanized nails, 1 in. and over..... \$2.25 over base
Galvanized nails, less than 1 in..... 2.50 over base
Bright plain wire, base, No. 9 gage, per 100 lb..... \$2.75
Annealed fence wire, base, per 100 lb..... 2.90
Spring wire, base, per 100 lb..... 3.70
Galvanized wire, No. 9, base, per 100 lb..... 3.35
Galvanized barbed, base, per 100 lb..... 3.80
Galvanized staples, base, per keg..... 3.80
Painted barbed wire, base, per 100 lb..... 3.45
Polished staples, base, per keg..... 3.45
Cement coated nails, base, per count keg..... 2.70
Bale ties, carloads to jobbers..... 75 and 2 1/2 per cent off list
Woven fence, carloads (to jobbers)..... 67 1/2 per cent off list
Woven fence, carloads (to retailers)..... 65 per cent off list

Bolts and Nuts

Machine bolts, small, rolled threads, 60, 10 and 10 per cent off list
Machine bolts, all sizes, cut threads, 60 and 10 per cent off list
Carriage bolts, 1/4 x 6 in.;
Smaller and shorter, rolled threads, 60 and 10 per cent off list
Carriage bolts, cut threads, all sizes..... 60 per cent off list
Lag bolts..... 65 and 10 per cent off list
Plow bolts, Nos. 1, 2 and 3 heads..... 50 and 10 per cent off list
Other style heads..... 20 per cent extra
Machine bolts, c.p.c. and t. nuts, 1/4 x 4 in., 50 and 10 per cent off list
Larger and longer sizes..... 50 and 10 per cent off list
Hot pressed square or hex. nuts, blank..... 4.50c. off list
Hot pressed nuts, tapped..... 4.50c. off list
C.p.c. and t. square or hex. nuts, blank..... 4.00c. off list
C.p.c. and t. square or hex. nuts, tapped..... 4.00c. off list
Semi-finished hex. nuts:
1/4 in. and smaller, U. S. S..... 80 and 5 per cent off list
1/4 in. and larger, U. S. S..... 75 and 5 per cent off list
Small sizes, S. A. E. 80, 10 and 5 per cent off list
S. A. E., 1/4 in. and larger..... 75, 10 and 5 per cent off list
Stove bolts in packages..... 75, 10 and 5 per cent off list
Stove bolts in bulk..... 75, 10, 5 and 2 1/2 per cent off list
Tire bolts..... 60 and 10 per cent off list
Bolt ends with hot pressed nuts..... 60 and 5 per cent off list
Turnbuckles, with ends, 1/4 in. and smaller, 50 to 55 and 5 per cent off list
Turnbuckles, without ends, 1/4 in. and smaller, 65 and 5 to 70 and 10 per cent off list
Washers 5c. to 5.25c. off list

Semi-Finished Castellated and Slotted Nuts

(To jobbers and consumers in large quantities f.o.b. Pittsburgh.)

	Per 1000	S. A. E. U. S. S.		Per 1000	S. A. E. U. S. S.
1/4-in.	\$4.80	\$4.80	1/4-in.	\$15.00	\$15.00
5/16-in.	5.50	6.00	5/16-in.	19.50	20.00
3/8-in.	6.50	7.00	3/8-in.	28.50	28.50
7/16-in.	9.00	9.50	7/16-in.	37.00	37.50
1 1/16-in.	11.00	11.50	1-in.	58.50	60.50

Larger sizes—Prices on application.

Cap and Set Screws

Milled square and hex. head cap screws..... 70 per cent off list
Milled set screws..... 70 per cent off list
Upset cap screws..... 75 and 10 per cent off list
Upset set screws..... 75 and 10 per cent off list
Milled studs 50 and 10 per cent off list

Rivets

Large structural and ship rivets, base, per 100 lb..... \$2.90
Small rivets 65, 10 and 5 off list

Track Equipment

Spikes, 1/8 in. and larger, base, per 100 lb..... \$3.05 to \$3.15
Spikes, 1/2 in., 1/8 in. and 1/4 in., per 100 lb..... 3.25 to 3.50
Spikes, 1/4 in. 3.25 to 3.50
Spikes, boat and barge, base, per 100 lb..... 3.25 to 3.50
Track bolts, 1/4 in. and larger, base, per 100 lb. 4.00 to 4.25
Track bolts, 1/2 in. and 1/4 in., base, per 100 lb. 5.00 to 5.50
Tie plates, per 100 lb..... 2.55 to 2.60
Angle bars, base, per 100 lb..... 2.75

Welded Pipe

Steel		Butt Weld	Iron	
Inches	Black	Galv.	Black	Galv.
1/8	45	19 1/2	1/4 to 1/2	+39
1/4 to 3/8	51	25 1/2	1/4 to 1/2	2
1/2	56	42 1/2	1/4 to 1/2	11
3/4	60	48 1/2	1 to 1 1/2	30
1 to 3	62	50 1/2	1 to 1 1/2	13

Lap Weld

Lap Weld		Butt Weld, extra strong, plain ends	
2	55	24 1/2	2 to 3
2 1/2 to 6	59	30 1/2	1/4 to 1/2
7 and 8	56	42 1/2	3 to 6
9 and 10	54	41 1/2	7 to 12
11 and 12	53	40 1/2	26

Lap Weld, extra strong, plain ends		Butt Weld, extra strong, plain ends	
2	53	24 1/2	2 to 3
2 1/2 to 4	57	30 1/2	1/4 to 1/2
4 1/2 to 6	56	45 1/2	4 1/2 to 6
7 to 8	52	39 1/2	7 to 8
9 and 10	45	32 1/2	9 to 12
11 and 12	44	31 1/2	16

To the large jobbing trade the above discounts are increased by one point, with supplementary discounts of 5 per cent on black and 1 1/2 points, with a supplementary discount of 5 per cent on galvanized.

Boiler Tubes

Lap Welded Steel	Charcoal Iron
2 to 2 1/2 in.	27
2 1/2 to 3 1/2 in.	37
3 in.	40
3 1/2 to 3 3/4 in.	42 1/2
4 to 13 in.	46

Less carload lots 4 points less.

Standard Commercial Seamless Boiler Tubes

Cold Drawn	
1 in.	55
1 1/4 and 1 1/2 in.	47
1 1/2 in.	31
2 and 2 1/4 in.	22
2 1/2 and 2 1/2 in.	32

Hot Rolled	
3 and 3 1/4 in.	38

Less carloads, 4 points less. Add \$8 per net ton for more than four gages heavier than standard. No extras for lengths up to and including 24 ft. Sizes smaller than 1 in. and lighter than standard gage to be sold at mechanical tube list and discount. Intermediate sizes and gages not listed take price of net larger outside diameter and heavier gage.

Seamless Mechanical Tubing

Carbon under 0.30, base..... 84 per cent off list

Carbon 0.30 to 0.40, base..... 82 per cent off list

Plus usual differentials and extras for cutting. Warehouse discounts range higher.

Seamless Locomotive and Superheater Tubes

Cents per Ft.	Cents per Ft.
2-in. O.D. 12 gage.... 15	2 1/4-in. O.D. 10 gage.... 20
2 1/2-in. O.D. 11 gage.... 16	3-in. O.D. 7 gage.... 35
2-in. O.D. 10 gage.... 17	1 1/4-in. O.D. 9 gage.... 15
2 1/2-in. O.D. 12 gage.... 17	5 1/2-in. O.D. 9 gage.... 55
2 1/2-in. O.D. 11 gage.... 18	5 1/2-in. O.D. 9 gage.... 57

Tin Plate

Standard cokes, per base box..... \$5.50

Terne Plate

(Per Package	20 x 28 in.)
base.....	\$11.00
8-lb. coating I. C.	11.30
12-lb. coating I. C.	12.70
15-lb. coating I. C.	13.95
20-lb. coating I. C.	14.95

Sheets

Blue Annealed

Nos. 9 and 10 (base), per lb..... 3c.

Box Annealed, One Pass Cold Rolled..... 2.75c. to 3.85c.

Automobile Sheets

Regular auto body sheets, base (22 gage), per lb..... 5.35c.

Galvanized

No. 28 (base), per lb..... 4.90c. to 5c.

Long Terne

No. 28 gage (base), 8-lb. coating, per lb..... 5.30c.

Tin-Mill Black Plate

No. 28 (base), per lb..... 3.85c.

Prices of Raw Materials, Semi-Finished and Finished Products

Ores

Lake Superior Ores, Delivered Lower Lake Ports

Old range Bessemer, 55 per cent iron.....	\$6.45
Old range non-Bessemer, 51½ per cent iron.....	5.70
Mesabi Bessemer, 55 per cent iron.....	6.20
Mesabi non-Bessemer, 51½ per cent iron.....	5.55
<i>Foreign Ore, per Unit, c.i.f. Philadelphia or Baltimore</i>	
Iron ore, low phos., copper free, 55 to 58 per cent iron in dry Spanish or Algerian.....	11.00c.
Iron ore, Swedish, average 66 per cent iron.....	9.50c.
Manganese ore, washed, 51 per cent manganese, from the Caucasus, nominal.....	41c.
Manganese ore, ordinary, 48 per cent manganese, from the Caucasus.....	38c.
Manganese ore, Brazilian or Indian, nominal.....	42c.
Tungsten ore, per unit, in 60 per cent concentrates.....	\$8.25 to \$10.00
Chrome ore, basic, 48 per cent Cr ₂ O ₃ , crude, per ton, c.i.f. Atlantic seaboard.....	18.00 to 28.00
Molybdenum ore, 85 per cent concentrates, per lb. of MoS ₂ , New York.....	75c. to 85c.

Ferroalloys

Ferromanganese, domestic, 80 per cent, furnace, or seaboard, per ton.....	\$109.00 to \$110.00
Ferromanganese, British, 80 per cent, f.o.b. Atlantic port, duty paid.....	110.00
Ferrosilicon, 50 per cent, delivered.....	75.00
Ferrotungsten, per lb. contained metal.....	85c. to 90c.
Ferrochromium, 4 to 6 per cent carbon, 60 to 70 per cent Cr, per lb. contained Cr, delivered.....	10.75c.
Ferrochromium, 6 to 7 per cent carbon, 60 to 70 per cent Cr, per lb.....	10.50c.
Ferrovanadium, per lb. contained vanadium.....	\$3.50 to \$4.00
Ferrocortontitanium, 15 to 18 per cent, per net ton.....	200.00

Spiegeleisen, Bessemer Ferrosilicon and Silvery Iron

(Per gross ton furnace unless otherwise stated)

Spiegeleisen, domestic, 19 to 21 per cent.....	\$38.00 to \$39.00
Spiegeleisen, domestic, 16 to 19 per cent.....	37.00 to 38.00
Ferrosilicon, Bessemer, 10 per cent, \$41.50; 11 per cent, \$44.12 per cent, \$46.50.	
Silvery iron, 6 per cent, \$30.00; 7 per cent, \$31.00; 8 per cent, \$32.50; 9 per cent, \$34.50; 10 per cent, \$36.50; 11 per cent, \$39.00; 12 per cent, \$41.50.	

Fluxes and Refractories

Fluorspar, 80 per cent and over calcium fluoride, not over 5 per cent silica, per net ton f.o.b. Illinois and Kentucky mines.....	\$22.00
Fluorspar, 85 per cent and over calcium fluoride, not over 5 per cent silica, per net ton f.o.b. Illinois and Kentucky mines.....	23.50
Per 1000 f.o.b. works:	
Fire Clay:	
Pennsylvania.....	\$42.00 to \$45.00
Maryland.....	47.00
Ohio.....	42.00 to 43.00
Kentucky.....	42.00 to 43.00
Illinois.....	42.00 to 45.00
Missouri.....	35.00 to 40.00
Ground fire clay, per net ton.....	6.00 to 7.00
Silica Brick:	
Pennsylvania.....	42.00
Chicago.....	49.00
Birmingham.....	50.00
Ground silica clay, per net ton.....	8.00
Magnesite Brick:	
Standard size, per net ton (f.o.b. Baltimore and Chester, Pa.).....	65.00
Grain magnesite, per net ton (f.o.b. Baltimore and Chester, Pa.).....	40.00
Chrome Brick:	
Standard size, per net ton.....	48.00

Semi-Finished Steel, F.O.B. Pittsburgh or Youngstown, per gross ton

Rolling billets, 4-in. and over.....	\$40.00
Rolling billets, 2-in. and under.....	40.00
Forging billets, ordinary carbons.....	45.00
Sheet bars, Bessemer.....	42.50
Sheet bars, open-hearth.....	42.50
Slabs.....	40.00
Wire rods, common soft, base, No. 5 to 1-in.....	51.00
Wire rods, common soft, coarser than 1-in.....	\$2.50 over base
Wire rods, screw stock.....	\$5.00 per ton over base
Wire rods, carbon 0.20 to 0.40.....	3.00 per ton over base
Wire rods, carbon 0.41 to 0.55.....	5.00 per ton over base
Wire rods, carbon 0.56 to 0.75.....	7.50 per ton over base
Wire rods, carbon over 0.75.....	10.00 per ton over base
Wire rods, acid.....	15.00 per ton over base
Skelp, grooved, per lb.....	2.35c.
Skelp, sheared, per lb.....	2.35c.
Skelp, universal, per lb.....	2.35c.

Finished Iron and Steel, F.O.B. Mill

Rails, heavy, per gross ton.....	\$43.00
Rails, light, new steel, base, lb.....	2.25c.
Rails, light, re-rolled, base, per lb.....	1.85c. to 2.00c.
Spikes, 1/4-in. and larger, base, per 100 lb.....	\$3.00 to \$3.15
Spikes, 1/2-in. and smaller, base, per 100 lb.....	3.15 to 3.50
Spikes, boat and barge, base, per 100 lb.....	3.25 to 3.50
Track bolts, 1/4-in. and smaller, base, per 100 lb.....	4.00 to 4.25
Track bolts, 1/2-in. and larger, base, per 100 lb.....	4.50 to 5.00
Tie plates, per 100 lb.....	2.55 to 2.60
Angle bars, per 100 lb.....	2.75
Bars, common iron, base, per lb., Chicago mill.....	2.40c.
Bars, common iron, Pittsburgh mill.....	2.40c.
Bars, rails, steel reinforcing, base, per lb.....	2.15c. to 2.25c.
Cold finished steel bars, base, Chicago per lb.....	3c.
Ground shafting, base, per lb.....	3.40c.
Cut nails, base, per kg.....	\$3.15 to \$3.25

Alloy Steel

S.A.E. Series Numbers	Bars 100 lb.
2100* (1/2% Nickel, 10 to 20 per cent Carbon).....	\$3.50
2300 (3 1/2% Nickel).....	5.00 to 5.25
2500 (5% Nickel).....	7.75 to 8.00
3100 (Nickel Chromium).....	4.00 to 4.25
3200 (Nickel Chromium).....	5.75 to 6.00
3300 (Nickel Chromium).....	8.00 to 8.25
3400 (Nickel Chromium).....	7.00 to 7.25
5100 (Chromium Steel).....	3.75
5200* (Chromium Steel).....	7.50 to 8.00
6100 (Chromium Vanadium bars).....	4.75 to 5.00
6100 (Chromium Vanadium spring steel).....	4.50 to 4.75
9250 (Silico Manganese spring steel).....	3.75 to 4.00
Nickel Chrome Vanadium (0.60 Nickel, 0.50 Chromium, 0.15 Vanadium).....	5.00 to 5.25
Chromium Molybdenum bars (0.80—1.10 Chromium, 0.25—0.40 Molybdenum).....	4.50 to 4.75
Chromium Molybdenum bars (0.50—0.70 Chromium, 0.15—0.25 Molybdenum).....	4.25 to 4.50
Chromium Molybdenum spring steel (1—1.25 Chromium, 0.30—0.50 Molybdenum).....	4.75 to 5.00

Above prices are for hot-rolled alloy steel bars, forging quality, per 100 lb., f.o.b. Pittsburgh. Billets 4 x 4 in. and larger are \$10 per gross ton less than net ton price for bars of same analyses. On smaller than 4 x 4-in. billets the net ton bar price applies.

*Not S.A.E. specifications, but numbered by manufacturers to conform to S.A.E. system.

Freight Rates

All rail freight rates from Pittsburgh on finished iron and steel products, carload lots, 36,000 lb. minimum carload, per 100 lb.:

Philadelphia, domestic.....	Buffalo.....	\$0.265
Philadelphia, export.....	Cleveland.....	0.215
Baltimore, domestic.....	Cleveland, Youngstown.....	
Baltimore, export.....	Comb.	0.19
New York, domestic.....	Detroit.....	0.29
New York, export.....	Cincinnati.....	0.29
Boston, domestic.....	Indianapolis.....	0.31
Boston, export.....	Chicago.....	0.34

*Applies minimum carload 30,000 lb. †Minimum loading 46,000 lb.

Rates from Atlantic Coast ports (i.e., New York, Philadelphia and Baltimore) to Pacific Coast ports of call on most steamship lines, via the Panama Canal, are as follows: Pig iron, 35c.; ship plates, 40c.; ingot and muck bars, structural steel, common wire products including cut or wire nails, spikes, and wire hoops, 40c.; sheets and tin plates, 40c.; sheets, No. 12 gage and lighter, 50c.; rods, 40c.; wire rope cables and strands, 45c.; wire fencing, netting and stretcher, 40c.; pipes not over 12 in. in diameter, 55c.; over 12 in. in diameter, 2 1/2c. per in. or fraction thereof additional. All rates per 100 lb. in carload lots, minimum 36,000 lb.

FABRICATED STEEL BUSINESS

Awards Exceed 31,000 Tons and Fresh Inquiries Call for 51,000 Tons

Industrial buildings loom large in the bookings of fabricated steel work in the past week, accounting for nearly two-thirds of the upward of 31,000 tons placed. Private enterprises made up 27,000 tons of the 51,000 tons of fresh proposals, but not much of these were for factories. One-fifth of the new projects appearing was for the railroads. Among awards were the following:

Yonkers Telephone Co., exchange building, Yonkers, N. Y., 600 tons, to Hadden Iron Construction Co.

James Madison High School, New York, 3000 tons, to Jones & Laughlin Steel Corporation.

Anaconda Copper Mining Co., building at Anaconda, Mont., 500 tons, to American Bridge Co.

Steinway & Sons, offices and piano warerooms, New York, 2800 tons, to American Bridge Co.

Southern Railway, 160 tons for bridge and 300 tons for extension of shops at Somerset, Ky., placed with unnamed fabricator.

Garage, Forty-eighth Street, New York, 500 tons, to National Bridge Works.

Service building, Sixtieth Street and West End Avenue, New York, 1100 tons, to Hinkle Iron Co.

Loft building, 1 West Forty-seventh Street, New York, 1750 tons, to George A. Just Co.

Ford Motor Co., assembly buildings, Memphis, Tenn., 1625 tons; Charlotte, N. C., 1625 tons; Jacksonville, Fla., 750 tons, to Virginia Bridge & Iron Co.

Public Service Co. of Northern Illinois, transmission towers, 1700 tons, to Riter-Conley Co.

Richardson County Court House, Falls City, Neb., 135 tons, to Omaha Steel Works.

High school, South Bend, Ind., 154 tons, to unnamed fabricator.

American Kardex Co., Tonawanda, N. Y., factory building, 200 tons, to Fort Pitt Bridge Works.

Central Tube Co., Economy, Pa., addition, 1400 tons, to Jones & Laughlin Steel Corporation.

Dells Paper & Pulp Co., Eau Claire, Wis., beater, finishing and machine rooms, 455 tons, to Worden-Allen Co.

Tonawanda Iron Corporation, Tonawanda, N. Y., 12-ton ore bridge, 450 tons, to Milwaukee Bridge Co., Mead-Morison Co., general contractor.

Milwaukee Lodge No. 46, B. P. O. E., club house, 370 tons, to Lakeside Bridge & Steel Co.

Kentucky Jockey Club, Louisville, Ky., grand stand, 200 tons, to Granger & Co.

Louisville Portland Cement Co., Speed, Ind., 100 tons, to Snead Architectural Iron Works.

Ohio River dams, horses and props, 750 tons, American Car & Foundry Co., low bidder.

Ohio River improvements, lock gates, 150 tons, Penn Bridge Co., low bidder.

Louisville & Nashville Railroad, machine shop at Etowah, Tenn., 450 tons, to Ingalls Iron Works.

Ford Motor Co., Detroit, upset and pressed steel buildings, 9000 tons, to McClintic-Marshall Co.

Filtration plant, Cleveland, 916 tons, to T. H. Brooks & Co.

Structural Projects Pending

Inquiries for fabricated steel work include the following:

Parlex Holding Corporation, New York, contemplating construction of office building at Fourth Avenue, Thirty-second to Thirty-third Street, which will require about 20,000 tons, but inquiry has not yet come to the steel trade.

Department of Plant and Structures, City of New York, central motor repair shop, Sixteenth Street and Avenue C, New York, 10,000 tons; bids close Jan. 15.

Baltimore & Ohio Railroad, bridges, 600 tons. New York, New Haven & Hartford Railroad, bridge, 200 tons.

National Bible Institute, West Fifty-fifth Street, New York, 900 tons.

Central Railroad of New Jersey, bridge at Allentown, Pa., 500 tons.

State of Pennsylvania, storage sheds for road-building equipment, 750 tons.

Marks Brothers' loft building, Sixty-fifth Street, near Eleventh Avenue, New York, 350 tons.

Chicago Union Station Co., train sheds, 5000 tons.

Lake Shore Athletic Club, Chicago, foundation, 1700 tons, American Bridge Co., low bidder; superstructure, 4000 tons, plans out this week.

Louisville & Nashville Railroad, freight house, New Orleans, 1200 tons.

Martha Realty Building, Kansas City, Mo., 700 tons, bids taken Jan. 5.

Board of Education, Chicago, two grammar school buildings, 500 tons each, bids taken this week.

Board of Commissioners, Port of New Orleans, double deck bridge for ferry landing, 215 tons.

Commonwealth Edison Co., Chicago, turbine room floor, Crawford Avenue station, 300 tons.

North Side theater for Balaban & Katz, Chicago, 1700 tons.

Pensacola, Fla., theater, 400 tons.

Great Northern Railroad, 4 girder spans, 160 tons.

Union Pacific, 140 ft. deck truss span, 175 tons.

Mobile & Ohio Railroad, 150 ft. truss span, 190 tons.

Mare Island Navy Yard, Cal., two 50,000-bbl. oil tanks and two smaller tanks, 600 tons.

New York, New Haven & Hartford Railroad, bridges, Dixwell Avenue, New Haven, Conn., 150 tons; Moosup, Conn., 100 tons.

County Commissioners, Stark County, Canton, Ohio, two bridges, 200 tons, bids taken.

Union Land & Building Co., Youngstown, office building, 600 tons, bids taken.

Louisville & Nashville Railroad, bridge work, 1950 tons, bids close Jan. 14.

Lunkenheimer Co., Cincinnati, shop addition, 650 tons, bids to be taken shortly.

U. S. Engineer Office at Milwaukee, steel dump scows and barge, 300 tons, bids close Jan. 16.

Clark Street bridge, Stevens Point, Wis., 150 tons, bids opened Jan. 3 and were rejected.

Insurance Co. of North America, building at Sixteenth and Arch Streets, Philadelphia, 6000 tons; Stone & Webster, general contractors.

Ford Motor Co., assembly plant in Philadelphia, 3000 tons; former bids rejected.

Lehigh Coal & Navigation Co., coal breaker at Lansford, Pa., 3300 tons.

Buhl Building, Detroit, 4000 tons.

RAILROAD EQUIPMENT BUYING

Car Body and Rebuilding Inquiries Items in Week's Developments

An inquiry for car bodies for the Pennsylvania Railroad, early expectation of car buying by the New York Central, and inquiries covering rebuilding proposals are among the week's developments in the railroad equipment field. Among the items may be mentioned the following:

The Pennsylvania Railroad, which has not been a buyer of cars for some time, has entered the market for 3000 all-steel box car bodies, and may buy other car bodies later, as it has 10,000 trucks to equip.

The Great Northern Railway is in the market for 8 dining cars and expects to place the order this week.

Bids are in on 3057 refrigerator cars for the Pacific Fruit Express and on 775 refrigerator cars for the Western Pacific.

The New York Central will buy 10,000 freight cars, but formal inquiries have not yet been received by car builders.

The Big Four is asking for prices on the conversion of 200 to 700 box cars to 40-ton stock cars.

The Chesapeake & Ohio has placed 25 steel underframes for caboose cars with the Illinois Car & Mfg. Co.

The Seaboard Air Line is inquiring for the rebuilding of 299 50-ton steel phosphate cars.

Steel Pipe Delivered by Water

ST. LOUIS, Jan. 7.—A shipment of 5000 tons of steel pipe, part of a cargo of 11,000 tons of that material which left Pittsburgh, Dec. 13, by river, reached St. Louis, Dec. 25. The shipment was made by the Jones & Laughlin Steel Corporation.

Fifteen barges in tow of a steamer belonging to the company left Pittsburgh. Three barges were set off at Louisville, two at Evansville, and the remaining 10 were turned over at Cairo to the Mississippi Warrior (Federal Barge Line) Service. Two of these latter were delivered by the Federal Barge Line at Memphis, and the remaining eight were towed upstream to St. Louis.

The pipe brought to St. Louis will be distributed by rail to the oil fields of Oklahoma, Kansas and Wyoming.

NON-FERROUS METALS

The Week's Prices

Jan.	Cents per Pound for Early Delivery													
	Copper, New York		Straits		Lead		Zinc		Electrolytic*	New York	New York	St. Louis	New York	St. Louis
	Lake	Electrolytic*	New York	New York	St. Louis	New York	St. Louis	New York						
2.....	13.12½	12.75	47.12½	8.15	7.80	6.62½	6.27½							
3.....	13.12½	12.62½	47.25	8.20	7.85	6.62½	6.27½							
4.....	13.12½	12.62½	46.90	8.25	7.90	6.65	6.30							
5.....	13.12½	12.62½	...	8.25	7.90	6.67½	6.32½							
7.....	13.12½	12.62½	47.37½	8.25	7.90	6.72½	6.37½							
8.....	13.12½	12.62½	48.00	8.25	7.95	6.77½	6.42½							

*Refinery quotation; delivered price ¼c. higher.

New York

NEW YORK, Jan. 8.

There is no marked activity thus far this year in any of the markets. Copper is in poor demand and is lower. The tin market is strong and higher. Scarcity of lead continues to feature that market, with prices advancing. The zinc market has taken on renewed strength so far as quotations are concerned, with fair buying.

Copper.—The weakness in the electrolytic copper market which appeared toward the close of last year has continued and prices are a little lower. For delivery in the first quarter business is being done at 12.87½c., delivered, or 12.62½c., refinery. Transactions are, however, light and there is almost a complete absence of foreign demand. The lack of interest of foreign buyers is ascribed to the fall in exchange and the European situation generally. Domestic consumers, having covered requirements pretty fully for the first quarter during December, are naturally letting the market drift. Lake copper is quoted at 13.12½c., delivered.

Tin.—Generally there has been less buying of Straits tin in the last two weeks and, during part of last week, business was almost at a standstill, there being no pressure to sell and no desire to buy. Late Friday, Jan. 4, fair sales were made and some business was done on Saturday, bringing the total for that particular week to about 600 tons. Consumers were buyers during this period. Late yesterday the market assumed somewhat of a booming character and every offer of tin was taken both for local and London account. Sales were made up to 47.37½c., with 47.50c. asked for spot metal. Today the market was moderately active, with the quotation for spot Straits at 48c., New York. The London market today was also strong at an advance of £4 5s. per ton over yesterday, with spot standard quoted at £242 5s., future standard at £243 10s. and spot Straits at £244 10s., all about £9 per ton higher than a week ago. Sales of spot and future standard were 200 and 1300 tons respectively. Arrivals thus far this month have been 955 tons, with 9432 tons reported afloat. In the opinion of one large importer if the large consumption of tin continues this year as during last year consumers must buy more supplies. The future of the market, however, depends upon the time when such buying takes place.

Lead.—The lead market is strong and the metal is scarce. Better inquiry is reported than for some little time, but the tone is rather dull. As high as 8.15c to 8.20c. has been done for prompt and January delivery and it is generally acknowledged that lead cannot be bought for this position at less than 8.25c., New York, with the St. Louis quotation variously placed from 7.90c. to 8.10c. The leading interest advanced its price on Jan. 2 from 7.50c. to 7.75c., New York. In the last day or two some producers have been offering February lead at close to 7.80c., St. Louis, or 8.12½c., New York. The fact that books for February have been opened have made for an apparently easier market.

Zinc.—The prime Western zinc market has begun the year with sharp advances and better demand. Fairly liberal sales for domestic consumption were made yesterday at 6.37½c., St. Louis, or 6.72½c., New York. Today, however, by afternoon the price had advanced to at least 6.42½c., St. Louis, or 6.77½c., New York, with some sellers asking 6.45c., St. Louis. One cause of the

strong market is the probability of British buyers entering the market shortly and better buying for domestic consumption.

Nickel.—Shot and ingot nickel are quoted unchanged at 29c. to 32c., with electrolytic nickel held at 32c. by the leading producers. Both shot and ingot nickel in the outside market are quoted at 29c. to 32c. per lb.

Antimony.—Chinese metal continues scarce and high, with wholesale lots for early delivery quoted and sold at 10c., duty paid, New York.

Aluminum.—Virgin metal, 98 to 99 per cent pure, is quoted by importers at 27.25c. to 27.75c., duty paid, with only a few importers able to obtain the metal from foreign producers. The leading American producer does not make public its quotation.

Old Metals.—Red and yellow metals are discouraged but lead and aluminum find ready market at full prices. Dealers' selling prices are as follows:

	Cents Per Lb.
Copper, heavy and crucible	12.50
Copper, heavy and wire	11.50
Copper, light and bottoms	10.00
Heavy machine composition	10.75
Brass, heavy	8.00
Brass, light	6.25
No. 1 red brass or composition turnings	9.00
No. 1 yellow rod brass turnings	7.00
Lead, heavy	7.25
Lead, tea	6.25
Zinc	5.00
Cast aluminum	18.50
Sheet aluminum	18.50

Chicago

Jan. 8.—Copper and tin have declined, while lead and antimony have advanced. Copper has softened in the absence of buying but is believed to be in a fundamentally strong position with a probability that the attitude of consumers will show a marked change before the close of the month. Tin is weaker than the decline would indicate, and is believed to be due for a decided fall. Lead is stronger, but large dealers are unloading their stocks in the expectation that the next change in prices will be downward. Zinc is quiet but producers hope for export business and believe that prices are too low and that advances are in order. The strength of antimony is attributable to the low visible supplies due to the light shipments from China during the fall. Among the old metals yellow brass and lead pipe have advanced. We quote in carload lots: Lake copper, 13.25c.; tin, 48.25c.; lead, 8c.; spelter, 6.30c.; antimony, 12c., in less than carload lots. On old metals we quote copper, copper wire, crucible shapes and copper clips, 10.50c.; copper bottoms, 9.50c.; red brass, 8.75c.; yellow brass, 7c.; lead pipe, 6.75c.; zinc, 4.25c.; pewter, No. 1, 27c.; tin foil, 33c.; block tin, 38c.; all buying prices for less than carload lots.

W. P. Snyder Will Upheld

PITTSBURGH, Jan. 8.—The Pennsylvania State Supreme Court in a decision handed down at Philadelphia, Jan. 7, affirmed the decree of the Orphans' Court of Allegheny County, which upheld the will of the late William P. Snyder, former head of W. P. Snyder & Co., Pittsburgh, against efforts made by his daughter, Mrs. Mary B. Drew, on the ground that her father at the time of drawing his will did not have testamentary capacity. The decision means that the properties of Mr. Snyder will remain intact in charge of trustees for a period of 30 years and that the power of the trustees to operate the properties, which include iron ore mines, lake steamships, coal mines and blast furnaces, now is unhampered.

Civil Service Examinations

Examinations are announced by the United States Civil Service Commission, Washington, for a number of positions. Applicants may obtain detailed information from the commission. The examinations include the following:

- Junior engineer, \$1,200 to \$1,500 a year.
- Junior physicist, \$1,200 to \$1,500 a year.
- Junior technologist, \$1,200 to \$1,500 a year.
- Laboratory assistant, \$900 to \$1,380 a year.
- Architectural and structural steel draftsmen, \$1,800 a year.

PERSONAL

Harry Coulby has resigned as president and general manager of the Pittsburgh Steamship Co., Cleveland, subsidiary of the United States Steel Corporation, of which he has been the head for 20 years. He has been succeeded by A. F. Harvey, who has been with the company since its organization as assistant general manager and vice-president. Mr. Coulby will remain with the company as the chairman of the board of directors, his duties being limited to presiding at the board meetings. He is a member of the firm of Pickands, Mather & Co., Cleveland, and will devote much of his time to the affairs of that firm, although he plans to give less attention to business than he has in the past. He sailed



HARRY COULBY

Jan. 4 on a two or three months' trip to South America. As president of the Pittsburgh Steamship Co. Mr. Coulby has been at the head of the largest fleet on the Great Lakes. He was born in England and at the age of 18 years, 41 years ago, after saving enough money to pay for his ocean passage, sailed to New York and walked from there to Cleveland. He had read about the Great Lakes and wanted to see them. He tried to get work as a sailor but was rejected because of his inexperience. Having gained some knowledge of shorthand from a textbook that he had picked up, he turned to stenography as a livelihood. Later he secured a position as secretary for Col. John Hay, afterward Secretary of State and Ambassador to Great Britain, who at the time was engaged with John G. Nicolay in writing a life of Abraham Lincoln. Colonel Hay and Samuel Mather had married daughters of Amasa Stone, founder of the Lake Shore Railroad, and when the Lincoln biography was completed Mr. Mather gave Mr. Coulby a position as a clerk in the newly organized firm of Pickands, Mather & Co., dealers in iron ore and pig iron. The firm at the time consisted of two partners and three clerks. Mr. Coulby worked his way up, learning every branch of the lake shipping business until he became a member of the firm, with which he continued his active connection until elected president of the Pittsburgh Steamship Co. He celebrated his fifty-ninth birthday Jan. 1.

Robert M. Carter has resigned as sales manager of the Kempsmith Mfg. Co., Milwaukee, to become sales manager of the H. A. Smith Machinery Co., machine tool dealer, Syracuse, N. Y. He has had extensive experience, both in the sales and manufacturing branches of the machine tool industry. His connection with the Kempsmith company covers three years, following a year as sales manager of the Giddings & Lewis Machine Tool Co., Fond du Lac, Wis., prior to which he was for seven years in the sales department of the Gisholt Machine Co., Madison, Wis. Before the latter connection he was vice-president and works manager of the Peru Castings & Machinery Co., Peru, Ind. His other connections were as follows: Production manager, Chain Belt Co., Milwaukee; superintendent, Anchor Bolt & Nut Co. plant, Poughkeepsie, N. Y.; master mechanic, Cluett, Peabody & Co., Troy, N. Y.; tool maker, Sullivan Machinery Co., Claremont, N. H. His first practical experience was in the plant of the Lowell Machine Shops, now the Saco-Lowell Shops, Lowell, Mass.

Arthur A. Landon, vice-president American Radiator Co., has resigned, having consented to serve as counsellor to the executive committee in the United States, as well as to the advisory board in Paris, where he will spend part of his time. Mr. Landon came to

the company in 1895 as superintendent of the Kalama-zoo plant.

William B. Hewitt has been elected president and treasurer of the Blake Pump Co., Fitchburg, Mass.

George P. Hart, formerly president Stanley Works, New Britain, Conn., will sail on Jan. 18 from New York for a trip around the world. Mr. Hart expects to arrive back in New York, May 24.

R. H. Collins has resigned as president and general manager of the Peerless Truck & Motor Co., Cleveland, and W. H. Collins has resigned as vice-president and director. The former remains on the board of directors. D. A. Burke, present vice-president and director of sales, has been elected general manager and continues as vice-president. The operation of the plant has been placed in the hands of a committee headed by Mr. Burke. A new president will be elected later.

Linn Helander, of the general engineering department of the Westinghouse Electric & Mfg. Co., addressed a joint meeting of the American Institute of Electrical Engineers and the Providence Engineering Society on the evening of Jan. 4, the subject being "Some Features of Modern Large Turbine Installations."

Clarence H. Howard, president Commonwealth Steel Co., has been appointed a member of the Board of Police Commissioners of St. Louis by Governor Hyde of Missouri. The golden rule principle used in the Commonwealth steel mills will be employed by him in the administration of his police duties, Mr. Howard has declared.

George E. Taylor, formerly sales engineer for the R. & J. Dick Co., Inc., San Francisco, has been appointed San Francisco district manager for the Chain Belt Co., Milwaukee.

Charles C. Henderson, vice-president Allegheny Steel Co., Pittsburgh, has been elected a director of the Monongahela National Bank, Pittsburgh.

Earl E. Bates has been appointed assistant sales manager of A. M. Castle & Co., Chicago, steel jobbers.

Glenn A. Wilson, who formerly represented the Mutual Electric & Machine Co., has been appointed New York manager with headquarters at 120 Liberty Street, of the Gibb Instrument Co., Bay City, Mich., manufacturer of electric welding equipment.

William S. Elliott has been appointed general counsel for the International Harvester Co., Chicago, to succeed the late Judge William D. McHugh. Mr. Elliott is 43 years of age and a native of Jacksonville, Ill. He graduated from Princeton University in 1900 and from Harvard University law school in 1903. He engaged in general law practice in Chicago from 1904 to 1912, when he was appointed to the legal staff of the International Harvester Co.

J. S. Coffin, chairman of the board of directors of the Lima Locomotive Works, Lima, Ohio, has been elected president of that company, succeeding Lee Grand Parish, who recently resigned to devote his time to the business of the American Arch Co., of which he is president. Mr. Parish will continue as a member of the executive committee.

C. H. Smart, superintendent of the Springfield, Ohio, works of the International Harvester Co., has been appointed superintendent of the Deering plant, Chicago. Karl O. Schreiber, assistant to Mr. Smart, has been appointed superintendent at Springfield, with William F. Lacey as assistant.

Harry F. Bovard, Greensburg, Pa., has been elected president of the Keystone Coal & Coke Co., succeeding the late Julian B. Huff. Mr. Bovard has been identified with the Keystone company and its predecessors for 32 years, and his election as president means that he has gone from the bottom to the top of the company, as his first position was office boy.

Henry M. O'Bleness, assistant to president of the Midvale Steel & Ordnance Co. previous to the sale of the properties of that company to the Bethlehem Steel Co., has been elected vice-president of the Central Industrial Service Co., 852-6 Frick Building, Pittsburgh. He will move there from Philadelphia and engage actively in the management of the business. Prior to

going to Philadelphia four years ago, Mr. O'Bleness had been for several years with Carnegie Steel Co. in the executive department.

Prof. Will M. Sawdon, of Sibley College, Cornell University, a member of the American Society of Mechanical Engineers, has been elected mayor of Ithaca, N. Y.

Albert P. Spooner has been appointed engineer of tests at the Bethlehem plant of the Bethlehem Steel Co., succeeding Robert M. Bird, who resigned to associate himself with George F. Pettinos, 1206 Locust Street, Philadelphia, in the business of sand, gravel, foundry supplies and plumbago. Mr. Bird is a vice-president of the American Society for Steel Treating and is a member of the standards committee of the iron and steel division of the Society of Automotive Engineers. For 15 years he was connected with the Bethlehem company's heat treating department, most of that time as its superintendent. At the end of the war he was appointed metallurgist at the Bethlehem plant and later engineer of tests.

William C. Buell, Jr., of the firm, Buell, Schieb, Mueller, Inc., specializing in furnace design, has joined the engineering staff of the Chapman-Stein Furnace Co., Mount Vernon, Ohio. From 1906 to 1914 he was engineer with the Westmacott Furnace Co. and later was engineer of tests with Tate, Jones & Co. After two years' service in the engineers' corps during the World War, he returned to Tate, Jones & Co. and be-

came chief engineer. He was also chief engineer at one time of the George J. Hagan Co.

Louis J. Affelder, assistant division contracting manager of the central division, American Bridge Co., Pittsburgh, has been promoted to contracting manager of the division, succeeding the late Richard W. Bailey. Mr. Affelder has been with the American Bridge Co. since its organization about 24 years ago, having been identified with the Pittsburgh Bridge Co. when it was taken over by the American Bridge Co. He has been assistant division contracting manager for the past 12 years and also has had charge of the marine department to which he has devoted himself exclusively for the past three years. He is a graduate of the University of Pittsburgh, class of 1894. George E. Shepard, formerly assistant to the division contracting manager, has been appointed assistant contracting manager.

T. M. Girdler, for several years general superintendent of the Aliquippa works, Jones & Laughlin Steel Corporation, Woodlawn, Pa., has been promoted to the position of general manager with headquarters at Pittsburgh.

W. E. Frick, president Frick & Lindsay Co., mine and mill supplies, Pittsburgh, has been elected a director of the Columbia National Bank of that city.

A. L. Humphrey, president Westinghouse Airbrake Co., Wilmerding, Pa., has been elected a director of the First National Bank, Pittsburgh.

OBITUARY

William Herbert Gates

WILLIAM HERBERT GATES, vice-president and superintendent Eastern Machine Screw Corporation, New Haven, Conn., died Dec. 29 from double pneumonia. Mr. Gates was one of the leading authorities in this country on automatic screw machines and gave invaluable service to the country during the war, both in production in his own plant and by assisting in tooling up other factories.

He was born at Windsor, Vt., Jan. 1, 1867, and received his education in the grade schools in Milford, Conn., and Worcester, Mass. In 1883 he was employed by the Forehand Arms Co., Worcester, as a milling machine hand. At 19 he had charge of the screw department and at the



W. H. GATES

age of 22 he invented his first automatic screw machine and other such machines as the cylinder drilling machine, rifling machines, screw slotting and such machines pertaining to revolver, gun and rifle production. The Forehand Arms Co. was bought out by the Hopkins & Allen Co. of Norwich, Conn., and Mr. Gates went in 1900 with it to Norwich, where he had the contract on all of the small parts and the rifling work. He designed many breech-loading and repeating rifles, shotguns, revolvers and pistols. Although he designed in Worcester in 1891 the first magazine pistol, it was in 1909 at Norwich that he designed his last automatic pistol, which patent was later sold to the Marlin Fire Arms Co. He designed many kinds of special machinery for fire arms work.

In May, 1910, he organized the Eastern Machine Screw Corporation, New Haven, and it was originally equipped with his own single spindle screw machines. His work upon fine guns and high grade tools necessary to make them led Mr. Gates to become interested in high-grade tool methods and to his invention in 1914,

at the Eastern Machine Screw Corporation, New Haven, of the H&G self-opening die head, which was given the name "H&G," standing for Joseph E. Hubinger, president Eastern Machine Screw Corporation and for Mr. Gates, as inventor. Mr. Gates' acquaintance with screw machines had begun in Worcester with the Forehand Arms Co. in 1885 in connection with hand turret lathes, etc., and he became an authority on screw machine practice years ago.

The first die head which he made was of the rotating type for use on machines where the spindle rotated, such as the Gridley machine, and he later designed and brought out other styles of heads and sizes of heads, adaptable to practically all machines on which threading is done. His latest development in the H&G die head was a style designed for Brown & Sharpe automatics and placed on the market in 1919.

Additional inventions of Mr. Gates have been the H&G threading machine, brought out during the World War, pin machines, castellating machines, a nine operation automatic nipple machine for making nipples for wire wheels, the H&G collapsible tap and the H&G automobile socket wrench.

H. E. Cushman

HERBERT ELLSWORTH CUSHMAN, treasurer and general manager of the Morse Twist Drill & Machine Co., New Bedford, Mass., died suddenly at his home in that city on Dec. 27. Mr. Cushman was born at Taunton, Mass., in 1862, and was educated in the local schools. The first step in his business career was as clerk with the Taunton Locomotive Works. One year was spent in this capacity and six as head bookkeeper for the Williams Mfg. Co., and then he went with the Morse company as sales agent. His fine record earned for him in 1902 the promotion to treasurer and general manager, succeeding Gideon Allen, Jr., who became vice-president in that year. Mr. Cushman was prominent in business as director of banks and industrial corporations, as well as president of the Old Dartmouth Historical Society, Sons of the Revolution, and former president of the Board of Trade. Two brothers survive, Everett M. Cushman, superintendent Holmes Mfg. Co.; William A. Cushman, clerk at the Morse company, and two sisters.

CHARLES T. SIGLER, for the past two years assistant superintendent of the Pacific Coast Steel Co., San Francisco, died recently in that city, aged 48 years.

MATTHEW W. STEVENS, for many years superintendent at the Pencoyd Iron Works, Philadelphia, died, Dec. 25, at St. Petersburg, Fla., aged 78 years.

British Iron and Steel Market

Holidays Still Affect Conditions—Depreciation of Exchanges a Continental Factor—Ruhr 10-Hr. Day Hinders Resumption

(By Cable)

LONDON, ENGLAND, Jan. 8.

Pig iron is quieter, owing to the Scottish holidays, but the situation generally is unchanged. Demand from the domestic trade is broadening and indications are that further furnaces will be restarted shortly. Export buying still is poor, overseas consumers lacking confidence.

Hematite is firm with consumption absorbing the present output and forward sales commanding higher prices. East Coast mixed is selling at £5 2½s. (\$21.94) prompt and £5 3½s. (\$22.15) for January shipment. Foreign ore is quiet, sellers of Bilbao Rubio asking 24s. to 24½s. (\$5.14 to \$5.25) ex-ship Tees.

Finished iron and steel is dull, owing to the inactivity of the Scotch plants, but several good inquiries about export markets have come in and a renewed activity in domestic trade is expected when the holidays finally are over.

Continental markets are weak on continued depreciation of the exchanges and the reappearance in the market of German works at low figures. Most makers are anxious for orders, but buyers are not keen to commit themselves. Wire rods are quoted at £8 12½s. (\$36.92) f.o.b.

In Belgium business is handicapped by railroad congestion; prices are easier. In France the market has not fully recovered from the holidays, but makers are adopting a bold output policy.

In the Ruhr the resumption of plants has been hindered by the refusal of the workers in some cases to work the 10-hr. day.

Tin plate is quieter on reselling by merchants around 24s. (\$5.14) basis, IC, f.o.b., for prompt delivery. For forward position makers are asking 3d. (6c.) basis more, being well sold for several weeks ahead.

EXPORT TRADE STILL QUIET

Several Japanese Orders Placed, But Merchants Inactive—Importers Seek Market Here

NEW YORK, Jan. 8.—Following a period of slight activity at the end of the year, when a few large orders were placed, several from Japanese sources, export trade has quieted down. The dearth of merchant inquiry from Japan is accounted for partly by the fact that deliveries are now being made in Japan on orders placed soon after the earthquake and partly by the desire to know as accurately as possible the intentions and plans of the Government in reconstruction work.

Among the large orders placed at the close of last year was one for 10,000 tons of 60-lb. and 75-lb. rails and about 400-tons of splice bars from the Imperial Government Railways, which was awarded to Mitsui & Co., New York, and placed with the leading export interest. Another fair sized purchase was an order for 12,500 boxes of tin plate for a Japanese oil company, awarded to Iwai & Co., New York. Recently Frazar & Co., New York, booked an order from the Tokio Gas Co., for about 1000 tons of gas pipe and placed it with a prominent independent. Among current inquiries from Japan is one for close to 300 tons of railroad spikes from the South Manchuria Railway Co.

The Chinese markets are extremely dull, firm offers by Chinese merchants on second hand material, wire shorts, tin plate, sheets, pipe, etc., being as a rule too low to permit transactions. While there was still some inclination a few weeks ago to pay \$60 to \$61

Galvanized sheets are easy, with some works anxious sellers; but inquiry is broadening, with signs of India as a tentative buyer.

Black sheets are quiet but firm.

We quote per gross ton, except where otherwise stated, f.o.b. makers' works, with American equivalent figured at \$4.28 per £1, as follows:

Durham coke, delivered	£1 17s.	\$7.92
Bilbao Rubio ore	1 4	5.14
Cleveland No. 1 foundry	5 4	22.26
Cleveland No. 3 foundry	5 0	21.40
Cleveland No. 4 foundry	4 17	20.76
Cleveland No. 4 forge	4 16	20.54
Cleveland basic	5 0	21.40
East Coast mixed	5 2 1/2 to £5 3 1/4s.	21.94 to \$22.15
East Coast hematite	4 19 to 5 0	21.19 to 21.40
Ferromanganese	17 0	72.76
Ferromanganese	17 0	72.76
Rails, 60 lb. and up	9 0 to 10 0	38.52 to 42.80
Billets	8 5 to 8 15	35.31 to 37.45
Sheet and tin plate bars, Welsh	8 18 3/4	38.25
Tin plates, base box	1 3 3/4 to 1 4 1/4	5.08 to 5.19 C. per Lb.
Ship plates	9 15 to 10 5	1.86 to 1.96
Boiler plates	13 0 to 13 10	2.48 to 2.58
Tees	10 0 to 10 10	1.91 to 2.01
Channels	9 5 to 9 15	1.77 to 1.86
Beams	9 0 to 9 10	1.72 to 1.82
Round bars, 3/4 to 3 in.	10 10 to 11 0	2.01 to 2.10
Galvanized sheets, 24 g.	18 10 to 18 15	3.53 to 3.58
Black sheets, 24 gage	14 0	2.68
Black sheets, Japanese specifications	15 5	2.89
Steel hoops	12 10 & 12 15*	2.30 & 2.44*
Cold rolled steel strip, 20 gage	17 12 1/2	3.37
Cotton ties, Indian specifications	15 0	2.87

*Export price. †Ex-ship, Tees, nominal.

Continental Prices, All F. O. B. Channel Ports (Nominal)

Foundry pig iron:		
Belgium	£4 10s.	\$19.26
France	4 10	19.26
Luxemburg	4 10	19.26
Billets (nominal):		
Belgium	6 0	25.68
France	6 0	25.68 C. per Lb.
Merchant bars:		
Belgium	6 17 1/2 upward	1.31 upward
Luxemburg	6 17 1/2 upward	1.31 upward
France	6 17 1/2 upward	1.31 upward
Joists (beams):		
Belgium	6 10 upward	1.24 upward
Luxemburg	6 10 upward	1.24 upward
France	6 10 upward	1.24 upward
Angles:		
Belgium	8 0 to 8 5	1.53 to 1.58
1/4-in. plates:		
Belgium	7 15	1.46
Germany	7 15	1.46
1/8-in. plates:		
Luxemburg	7 15	1.46
Belgium	7 15	1.46

per ton, c. i. f. Chinese port for wire shorts, today, it is claimed by exporters to China, firm offers are generally less than \$60, sometimes by as much as \$2 to \$3 per ton. In addition, there is an apparent tendency to complain of the quality of the material received.

Importers are making consistent attempts to sell British, French or Belgian material to American consumers. No sizeable contracts, however, are known to have been made. Some negotiation is reported to have taken place on an inquiry for about 7000 tons of open-hearth billets, to be shipped, c. i. f. Boston, but no action has been taken. German prices are at present too high to permit of successful importation and deliveries are uncertain.

Continental pig-iron as well as British is too high to even be given consideration by Atlantic Coast consumers. A foundry in New Jersey was recently offered French foundry iron, but at a price about \$2 higher than the present cost of domestic iron delivered to the consumer's works. In the latter part of last year, the Pacific Coast proved a fairly good market for European products. Among other purchases made by the Pacific Coast were two orders, each for 1,000,000 sash pulley castings, placed in France.

Contracts for Caucasian manganese ore for delivery over the first half of this year have been fairly large. An importer in New York representing the manganese ore producers of the Caucasus reports contracts on hand for a total of about 100,000 tons of ore for first half delivery. A recent contract called for two cargoes, about 14,000 tons of washed ore for delivery to eastern Pennsylvania furnaces and 7000 tons of ordinary to be shipped, c. i. f. Mobile, Ala.

Machinery Markets and News of the Works

OUTLOOK IS IMPROVING

Railroads and Automobile Companies Predominate in Machine-Tool Prospects

National Carbon Co. Issues Inquiry for 35 Tools—Ford Motor Co. Again a Large Buyer—Railroads Placing Orders

An inquiry at Cleveland for 35 machine tools for the plants of the National Carbon Co. and renewed buying by automobile companies, particularly Ford, has brought about a more cheerful feeling in the Cleveland-Detroit district, while at Chicago and Cincinnati railroad buying and prospects of further orders soon from this source have created a new spirit of optimism.

The Ford Motor Co. is reported to have placed orders for about 60 special machines, of which 50 will be built by Cincinnati companies. Orders have also been placed by the Studebaker Corporation at Detroit and by the Olds Motor Works, Lansing, Mich., while the Buick Motor Car Co., Flint, Mich., is rounding out its equipment by scattered purchases.

In railroad buying the Southern Railway leads with orders for about 25 tools, and a further list from this road is expected soon to involve an expenditure of about \$800,000. The New York Central Lines are placing orders, principally at Cleveland, against recent inquiries. The Big Four is taking bids on several engine lathes for its Beech Grove shops; the Louisville & Nashville is reported to be preparing a list of equipment for a new shop at Etowah, Tenn., and orders are expected soon from the Union Pacific and Rock Island.

Electrical companies figure in recent buying, the General Electric, Westinghouse and Western Electric companies having all placed orders for standard tools, while the Western Electric Co. has bought special manufacturing equipment for its new plant now being built at Kearny, N. J. Increasing demand for radio equipment is doubtless responsible for the large inquiry of the National Carbon Co., maker of batteries. A Chicago manufacturer contemplates the purchase soon of 15 to 20 tools.

The first price advances in some time are announced, one by an Ohio maker of lathes and the other by an Indiana maker of multiple spindle drilling machinery.

New York

NEW YORK, Jan. 8.

IT is too early in the new year to look for any marked change in the demand for machine tools, the situation so far this month being a continuance of December conditions. The machine-tool trade has many prospects, however, upon which action was promised soon after Jan. 1 that an improvement in buying is expected to develop shortly. The Ingersoll-Rand Co., New York, has purchased a number of tools. The Department of Plant and Structures, New York, has bought an 1100-lb. steam hammer. The Bethlehem Steel Co., Bethlehem, Pa., purchased an engine lathe, 30 in. x 16 ft. Orders have come to an Eastern machine-tool company from the Cleveland, Cincinnati, Chicago & St. Louis Railroad for two axle lathes; from the Pere Marquette for a combination journal turning and axle lathe; from the Illinois Steel Co., Chicago, for three car-wheel bores.

S. Blickman, Inc., 536 Gregory Avenue, Weehawken, N. J., is in the market for a No. 5 and a No. 6 Bliss spinning lathe.

The Ferracute Machine Co., Bridgeton, N. J., is erecting a building, 50 x 100 ft. for its castings department and will need a 10-ton 46 ft. 8 in. span electric traveling crane.

The Universal Oil Burner Corporation, 6103 Fifth Avenue, Brooklyn, incorporated with 200 shares, no par value, will manufacture oil burners. Equipment needed includes drilling and tapping machines, motor attached, steel tubing and special malleable castings. J. J. Lauster heads the company.

The Arthur B. Shepard Co., Cleveland, has purchased two and one-half acres in Irvington, N. J., from the Gould & Eberhardt Co. and plans immediately to erect its first unit, 50 x 200 ft. It will manufacture fabricated steel buildings, used chiefly by oil companies.

Work will commence on an eleven-story factory, 80 x 129 ft., at 744-54 Washington Street, New York, for the Western Electric Co., 195 Broadway, estimated to cost \$625,000, for the manufacture of telephone equipment, cables, etc. McKenzie, Voorhees & Gmelin, 342 Madison Avenue, are architects.

The Utica Gas & Electric Co., Genesee Street, Utica, N. Y., is having plans drawn for a steam-operated electric power plant, with initial capacity of 66,000 hp., estimated

to cost \$250,000. The T. E. Murray Co., 55 Duane Street, New York, is engineer.

Bids will be received by the Bureau of Supplies and Accounts, Navy Department, Washington, until Jan. 22 for 1100 fire extinguishers for the Brooklyn Navy Yard, schedule 1743; 600 coal shovels, schedule 1748.

Arthur Rehberger & Son, Inc., 320 Ferry Street, Newark, manufacturer of automobile truck equipment, is in the market for an air compressor for drilling and riveting.

Bids will be asked at once by the Anheuser-Busch Ice & Cold Storage Co., 979 Brook Avenue, New York, for extensions and improvements, including the installation of additional equipment, estimated to cost \$170,000. Orphuls & Hill, 112 West Forty-second Street, are engineers.

The Bureau of Foreign and Domestic Commerce, Washington, has information regarding a marble quarry and plant to be installed by a company in Peru, S. A., in which it is purposed to use American drilling, cutting and polishing machinery, as well as stone-handling and conveying equipment, and power apparatus. Reference No. 114062.

The New York Edison Co., Irving Place and Fifteenth Street, New York, has purchased at a foreclosure sale the power house and adjoining property of the New York Railways Co., occupying the block bounded by Ninety-fifth and Ninety-sixth Streets, First Avenue and the East River, for \$800,000. The plant will be modernized and additional equipment installed for a central generating station.

Fire, Jan. 2, destroyed a portion of the plant of the Eastern Chair Co., Inc., 413 East Twenty-fifth Street, New York, with loss estimated at \$75,000, including machinery. It is planned to rebuild.

The State Hospital Commission, Capitol Building, Albany, N. Y., L. M. Farrington, secretary, has tentative plans for a two-story and basement cold storage and ice plant at the State Hospital, Raybrook, estimated to cost \$100,000 with machinery. Sullivan W. Jones, Capitol Building, is State architect.

The Baltimore & Ohio Railroad Co., 2 Wall Street, New York, will soon call for bids for the electrification of the first section of its lines on Staten Island, including power plant and line equipment. Bids on other sections will be asked in a few months. The entire project is estimated to cost \$15,000,000.

R. Liddelow, secretary of the State Electricity Commission, Melbourne, Victoria, Australia, will receive bids until Feb. 11 for four 100 kva., 25,400-6,600-volt transformers and spare parts, as per specifications on file at the office of the Bureau of Foreign and Domestic Commerce, 734 Customhouse, New York, and First National Bank Building, Chicago.

The E. V. Stratton Motor Co., Inc., Washington Street, Albany, N. Y., has had revised plans drawn for a three-story service and repair building, 110 x 112 ft., on Swan Street, to cost \$100,000 with equipment. The Ballinger Co., 100 East Forty-second Street, New York, is architect and engineer.

Power equipment, motors, conveying and other machinery will be installed in the fourteen-story printing and publishing plant to be erected at Ninth Avenue and Thirty-fourth Street, New York, by the Pictorial Review Co., 222 West Thirty-ninth Street, estimated to cost \$6,000,000. Renwick, Aspinwall & Tucker, 8 West Fortieth Street, are architects.

The Ford Motor Co., Highland Park, Detroit, plans the installation of additional machinery at its plant at Green Island, N. Y., for the manufacture of radiators, gears and transmissions, and other parts.

The Lago Petroleum Co., New York, recently organized by J. S. Cosden and H. N. Greis of Cosden & Co., 730 Fifth Avenue, oil refiners, and associates, plans the construction of an oil storage and distributing plant in the Lake Maracaibo section of Venezuela, where 2,290,000 acres of oil land has been purchased. It will cost in excess of \$200,000, with pumping and other machinery.

The Industrial Machinery Division, Bureau of Foreign and Domestic Commerce, Washington, has information regarding a project at Mazatlan, Mex., requiring American can-manufacturing machinery for a daily capacity of 2000 containers, and for mechanical steam-drying equipment for fish-packing. Reference 113661.

The Navy Purchasing Office, South and Whitehall Streets, New York, will take bids at once for 348 engine mill taper shanks, N. S. A. F. req. 283; also for 1000 graphite brushes.

The Adirondack Power & Light Co., 511 State Street, Schenectady, N. Y., will commence the construction of a one-story power plant, 145 x 200 ft., at Cranesville, N. Y., estimated to cost \$275,000 with generating and auxiliary machinery.

The Superintendent of Light Houses, Ketchikan, Alaska, will take bids until Feb. 12, for one gasoline hoist, two-drum, with derrick swinging gear, 30 hp.; and one stiff-leg derrick, for the Cape Spencer Light Station, Alaska.

The Computing-Tabulating-Recording Co., 50 Broad Street, New York, is arranging for a change of name to the International Business Machine Co., in connection with expansion, to include the acquisition of at least two other companies manufacturing kindred apparatus.

The Clemson Saw Co., Middletown, N. Y., has been formed with a capital of \$1,000,000 to take over and expand the plant and business of Clemson Brothers, Inc., manufacturer of hand and power hack saws, etc. G. N. and R. D. Clemson head the new organization.

The General Gas & Electric Corporation, 50 Pine Street, New York, operating electric light and power companies in New Jersey, Pennsylvania and other States, is disposing of a preferred stock issue of \$707,000, a portion of the proceeds to be used in connection with the development of a super-power system, with generating stations. W. S. Barstow is president.

The Lackawanna Railroad Co., Hoboken, N. J., has temporarily abandoned plans for the electrification of a number of its suburban lines and local terminal, to cost more than \$10,000,000, on which preliminary estimates recently were secured.

The Metallurgical & Chemical Co., Matawan, N. J., recently organized, has acquired the former local plant of the American Tin Smelters. Immediate possession will be taken and improvements made including the installation of additional equipment.

The Peerless Plush Mfg. Co., 71 Franklin Street, Paterson, N. J., plans for the construction of a power house at its new plant at Pleasantville, N. J., estimated to cost \$250,000.

The Briggs Bituminous Composition Co., 17 Battery Place, New York, is having plans drawn for a one-story plant at Wilson Avenue and Ball Street, Newark, estimated to cost \$37,000, including machinery. Walter Kidde & Co., 90 West Street, New York, are engineers.

Sloan & Chase, Inc., Newark, has been formed with a capital of \$200,000, to take over and expand the plant and business of the Sloan & Chase Mfg. Co., 351 Sixth Avenue, manufacturer of machinery and tools.

The United Color & Pigment Co., Evergreen Avenue, Newark, will commence the erection of a two-story addition, estimated to cost \$60,000. Plans are also under way for another extension to cost about \$12,000.

The Continental Can Co., 61 Broadway, New York, has filed plans for an addition to its plant at 610-24 Monmouth

Avenue, Jersey City, N. J., to cost approximately \$330,000. Francisco & Jacobus, 511 Fifth Avenue, New York, are consulting engineers.

The American Temperature Regulating Co., 286 Lyons Avenue, Newark, has acquired the Thermostat Service Co., 59 Bank Street, recently in receivership, and will merge with its plant.

Philadelphia

PHILADELPHIA, Jan. 7.

STANLEY G. FLAGG & CO., 1421 Chestnut Street, Philadelphia, manufacturers of iron and steel castings, have plans for rebuilding the No. 5 unit at Stowe, Pa., recently destroyed by fire with loss estimated at \$21,000. The Ballinger Co., Twelfth and Chestnut Streets, is architect.

Adolph Segal, Pennsylvania Building, Philadelphia, head of the Wilmington Sugar Refining Co., Wilmington, Del., now building a refinery at South Wilmington, has negotiations in progress for a lease of land at Port Newark, as a site for a new sugar refinery estimated to cost \$4,000,000. It will include a power house and machine shop.

The Union Tank Car Co., 21 East Fortieth Street, New York, has plans for a one-story steel car repair shop and plate works on Gallows Lane, Point Breeze, Philadelphia, 80 x 400 ft., with extension 60 x 235 ft., estimated to cost \$300,000, with equipment.

William D. Whitaker, Emerald and Westmoreland Streets, Philadelphia, manufacturer of rope, etc., has awarded a general contract to the William Steele & Sons Co., 219 North Broad Street, for a new three-story plant, 55 x 230 ft., and power house at N Street and Sedgley Avenue, to cost about \$105,000.

The American Engineering Co., Aramingo and Cumberland Streets, Philadelphia, operating a machine shop and foundry, has awarded a general contract to J. Y. Loux, Fifteenth Street and Hunting Park Avenue, for extensions in its Frankford plant, Sepviva Street and Wheatsheaf Lane.

The Yarnall-Waring Co., 102 East Mermaid Lane, Philadelphia, manufacturer of power plant equipment, has awarded a general contract to L. W. Kitselman, 125 East Upsal Street, for an addition for general manufacturing.

The Machine Tool & Equipment Co., Perry Street, Trenton, N. J., has purchased the entire machinery, tools, etc., at the former local plant of the Ingersoll Watch Co., from the Waterbury Watch Co., Waterbury, Conn., which acquired the property at a receiver's sale a number of months ago. The latter company will discontinue operations at this location, and is said to be planning to place the property on the market.

The Public Service Electric Co., Trenton, N. J., is concluding arrangements for the purchase of the Eureka Power Co., operating at Yardley, Pa., and Prospect Heights, N. J., and will merge with its properties. Extensions will be made and additional equipment installed.

Electric pumping machinery will be installed by the City Council, Lambertville, N. J., in connection with its proposed sewage disposal plant and system, estimated to cost \$130,000, for which plans will soon be drawn.

The Standard Tank & Seat Co., 314 North Front Street, Camden, N. J., manufacturer of plumbing equipment, will commence the erection of a three-story addition, 44 x 54 ft., estimated to cost \$25,000, exclusive of equipment.

The Landis Tool Co., Waynesboro, Pa., is having plans drawn for a one-story foundry, 70 x 160 ft., at Greencastle, Pa., to replace the structure recently destroyed by fire. It will cost about \$50,000. J. Elmer Frantz is general manager.

The Beaver Valley Coal Co., Hazleton, Pa., is planning to rebuild its coal breaker in the Mount Grove Valley section recently destroyed by fire, with loss estimated at \$50,000 including machinery. New equipment will be installed.

The Lehigh Coal & Navigation Co., Tamaqua, Pa., will electrify its No. 9 Colliery, replacing all present steam power equipment. Motors, controls, switchboard and other apparatus will be installed.

The Lloyd Forge Co., Annville, Pa., has tentative plans for the installation of additional equipment, to be used primarily for the manufacture of turn-buckles of special type, for which the company has received a large order, requiring about six months to complete.

The Railway & Industrial Engineering Co., Greensburg, Pa., is planning for the installation of an electric traveling crane, five to six tons capacity.

The Keystone Slag Co., Reading, Pa., headed by Jacob V. R. Hunter, has preliminary plans for rebuilding the portion of its slag roofing plant, with power house, recently destroyed by fire with loss estimated at \$100,000, including machinery.

The Crane Market

Few new inquiries for either overhead or locomotive cranes are reported at present. A few cranes were purchased in the closing days of last year and several good inquiries are pending, which will probably be closed shortly. An unusually large list of overhead cranes, monorail hoists and monorail, was recently sold by the Pawling & Harnischfeger Co., to the Long Bell Lumber Co., Long View, Wash. The order included: One 3-ton, 15-ft. span, cant handling crane; a 10-ton, 76-ft. span, timber handling crane; three monorail hoists, 4-ton, for transporting sorted lumber; three 20-ton, 22-ft. span, transfer cranes for kiln cars; two 5-ton, 75-ft. span and 65-ft. span cranes for the dry sorter; three 5-ton, 75-ft. span cranes for rough lumber shed; a 10-ton, 56-ft. 6-in. span, a 5-ton, 27-ft. span cranes and two 4-ton monorail hoists for a planing mill; four 5-ton 75-ft. span cranes for the dressed lumber shed and a total of about 7000 ft. of monorail track with seven two way switches.

Among inquiries still pending is the list of six locomotive cranes for the Baltimore & Ohio Railway, Baltimore, Md., the seven electric overhead cranes for the Western Electric Co., New York, the two 100-ton overhead cranes for the Pittsfield plant of the General Electric Co., a gantry crane for the Lehigh Valley Railroad, New York. Joseph T. Ryerson & Son, Chicago, are about to place an order for two 10-ton, double-trolley electric cranes. The Ferracute Machine Co., Bridgeton, N. J., is in the market for a 10-ton, 46-ft. 8-in. span electric traveling crane for an addition to its castings department.

Among recent purchases are:

Brooklyn Eastern District Terminal Co., Brooklyn, N. Y., a 25-ton, 53 ft. 10-in. span, gantry crane with 5-ton auxiliary, from the Chesapeake Iron Works.

General Electric Co., Schenectady, N. Y., a 5-ton overhead crane for the new Philadelphia plant, an addition to the original order of two 5-ton cranes on the list of 14, from the Chesapeake Iron Works.

Nassau Smelting & Refining Works, 603 West Twenty-ninth Street, New York, for the Tottenville Copper Co., Tottenville, S. I., New York, a 5-ton, 71-ft. 1-in. span electric traveling crane from the Shepard Electric Crane & Hoist Co.

Federal Shipbuilding Co., Kearny, N. J., six 1-ton electric hoists from Alfred Box & Co.

Staten Island Shipbuilding Co., Stapleton, S. I., New York, four 1-ton electric hoists from Alfred Box & Co.

Anaconda Copper Co., 25 Broadway, New York, a 5-ton, 80-ft. span, 3-motor electric traveling crane with 10-ton trolley from the Whiting Corporation.

Lehigh Valley Railroad, 143 Liberty Street, New York, a 10-ton, 37-ft. 6-in. span gantry crane for Sayre, Pa., from the Whiting Corporation.

Wagner Contracting Co., Jersey City, N. J., a 20-ton locomotive crane from the Browning Co.

I. T. Williams & Sons, Eleventh Avenue and Twenty-fifth Street, New York, a 30-ton locomotive crane for Carteret, N. J., from the Ohio Locomotive Crane Co.

Stillman, Delehaney & Ferris, Jersey City, N. J., a 20-ton used Browning locomotive crane from the Hoisting Machinery Co., New York and a 20-ton locomotive crane from the Browning Co.

Winnipeg Light & Power Co., Winnipeg, Ont., a 25-ton locomotive crane from the McMyler Interstate Co.

A. Lanece, contractor, Cleveland, a 10-ton locomotive crane from the McMyler Interstate Co.

Pere Marquette Railroad, Chicago, eight small jib cranes from the Whiting Corporation.

Walsh Construction Co., Davenport, Iowa, a 5-ton hand power crane from the Whiting Corporation.

American Locomotive Co., New York, a 5-ton hand power jib crane from the Whiting Corporation.

Illinois Central Railroad, Chicago, a 10-ton electric traveling crane from the Whiting Corporation.

Steel Sales Corporation, Chicago, a 5-ton electric traveling crane from the Whiting Corporation.

Monongahela Railway Co., Brownsville, Pa., a 15-ton hand power pillar crane from the Whiting Corporation.

Missouri Pacific Railroad, St. Louis, an overhead trolley system from the Whiting Corporation.

American Steel & Wire Co., 18 hand power cranes for the Joliet, Ill. and Anderson, Ind. plants from H. D. Conkey & Co.

Village of Winnetka, Ill., a 10-ton, 33-ft. span power house crane from H. D. Conkey & Co.

Phoenix Utility Co., 71 Broadway, New York, a 2-ton hand power crane from H. D. Conkey & Co.

De La Vergne Machine Co., New York, a 1-ton overhead crane from H. D. Conkey & Co.

Manual training equipment will be installed in the two-story and basement high school to be erected at Hershey, Pa., to cost about \$175,000, for which plans are being drawn by C. Emlen Urban, Woolworth Building, Lancaster, Pa., architect.

Fire, Dec. 29, destroyed a portion of the packing plant of the Giant Portland Cement Co., Coplay, Pa., with loss estimated at \$55,000, including equipment. It is planned to rebuild. Headquarters of the company are in the Pennsylvania Building, Philadelphia.

The Scranton Top Co., Wyoming Avenue and Walnut Street, Scranton, Pa., manufacturer of automobile tops and frames, is planning the installation of additional equipment to replace a recent fire loss. E. B. Lewis is head.

The Chantrell Hardware & Tool Co., Reading, Pa., will commence the erection of a three-story addition, 140 x 150 ft., estimated to cost \$55,000, exclusive of machinery.

Buffalo

BUFFALO, JAN. 7.

PLANS have been filed by the Truck Equipment Co., 1791 Fillmore Avenue, Buffalo, manufacturer of motor truck apparatus, for an addition to cost about \$25,000.

The National Casket Co., 123 Franklin Street, Buffalo, has work under way on a four-story plant totaling 25,000 sq. ft., to cost \$85,000. The present works will be removed to the new location and additional equipment installed.

The Ford Motor Co., Highland Park, Detroit, has taken title to property on the River Road, near Hertel Avenue, Buffalo, as a site for a five-story assembling plant, 100 x 300 ft., for which plans are being drawn by Albert Kahn, 1000 Marquette Building, Detroit, architect. It will cost about \$500,000, with machinery.

The Kardex Co., Main Street, North Tonawanda, N. Y., manufacturer of office filing equipment, has awarded a general contract to the H. K. Ferguson Co., Cleveland, for a one-story addition, 100 x 600 ft., to cost approximately \$200,000 with equipment.

The Niagara Falls Power Co., Niagara Falls, N. Y., has preliminary plans for a new power house and distribut-

ing station in the east side section, Buffalo, with capacity of 450,000 kw., to cost approximately \$600,000. J. Allen Johnson is electrical engineer.

The New York Zinc Co., Edward, N. Y., has acquired the local plant and property of the Northern Ore Co. and plans extensive development and the installation of additional mining and milling equipment. T. I. Crane is president of the purchasing company, and Frank B. Haley, secretary and treasurer.

The Union Tool Chest Co., Hand Street, Rochester, N. Y., has preliminary plans for the installation of additional equipment. G. N. Perkins is president.

The Consolidated Brick Co., Horseheads, near Elmira, N. Y., has tentative plans for the rebuilding of the portion of its plant and power house, recently destroyed by fire with loss estimated at \$200,000 including machinery.

F. J. Brown, Richburg, N. Y., and associates, have leased the Fritts oil properties, Richburg Hill, totaling about 100 acres, and plan to purchase oil-drilling machinery, storage plant and distributing equipment, and considerable electric power apparatus.

The United Battery Corporation, Northwestern Title Building, Carthage, N. Y., is having plans drawn for a one-story factory 150 x 200 ft., to manufacture electric batteries and equipment. Bids will be asked early in the spring. Gustave Koehler, 6-A North Hamilton Street, Poughkeepsie, N. Y., is engineer.

The United States Rubber Co., Broadway and Fifty-eighth Street, New York, has leased a four-story and basement building to be built at 133 Swan Street, Buffalo, totaling 115,000 sq. ft., to cost \$150,000, for a factory branch. It will be ready for occupancy in the spring, and will be owned by W. L. Marcy, Buffalo.

The Board of Water Commissioners, Buffalo, has rejected bids for centrifugal pumping machinery for the proposed \$4,000,000 filtration plant and will take new bids in the near future.

The Diefendorf Gear Corporation, Pearl Street, Syracuse, N. Y., has removed its plant to 920 West Belden Avenue, totaling about 50,000 sq. ft., where additional equipment will be provided for enlargements.

The Commissioner of Canals and Waterways, Albany, N. Y., will commence the construction of a power plant at Lock 29, State Barge Canal, Palmyra, N. Y., to cost about \$100,000.

Manual training equipment will be installed in the new high school to be erected on the campus, Dunkirk, N. Y., estimated to cost \$500,000, for which bids will be asked on a general contract about Jan. 15. E. E. Joralemon, 482 Delaware Avenue, Buffalo, is architect.

New England

BOSTON, Jan. 7.

SUFFICIENT time has not elapsed to permit most users of machine tools to complete inventories and allow action on 1924 budgets. The machine tool market therefore is in a waiting attitude and in the opinion of the local trade will not assume any degree of activity much before the end of another week. Several small, yet fairly important prospects, as well as a goodly number of one and two-tool prospects are expected to mature when business gets under way again. Special production tools are at or near the head of the tools required by manufacturers. No large lists are out. New England machine tool builders, generally speaking, are less active than they have been in a year. A decrease in activities, however, is expected at this season. Machine parts, small tools and gages are in greater demand than a year ago, but not as active as during November.

A 100-ton crane wanted for a Fall River power house, bids for which have been asked by Stone & Webster, Boston, is the one bright spot in the crane market.

The H. P. Townsend Mfg. Co., 5 Chestnut Street, Hartford, Conn., riveting and automatic screw machinery, has received an order for 11 special riveting machines from the Remington Typewriter Co., and two from the United States Post Office Department, the latter for use in riveting locks and seams of mail pouches.

The E. Horton & Son Co., Windsor Locks, Conn., has issued new prices on chucks, representing advances of 50c. to \$3 each as follows: 0 to $\frac{1}{4}$ -in., \$7.50; 0 to $\frac{3}{8}$ -in., \$8.50; 0 to $\frac{1}{2}$ -in., \$11; $\frac{1}{4}$ -in. to $\frac{3}{4}$ -in., \$20; $\frac{1}{2}$ -in. to 1-in., \$28 each, list.

The Westfield Mfg. Co., Westfield, Mass., bicycles, is installing oil burning equipment in its brazing department, to replace coal burning.

The Andrew Terry Co., Terryville, Conn., castings, is erecting a unit to house machinery for preparing fuel for foundry use.

Preliminary plans have been made for a five-story and basement Mechanics Arts School addition, Belvidere and Dalton Streets, Boston, to cost approximately \$240,000. Thomas P. Glynn, chairman school house commission, City Hall Annex, is in charge of plans.

The Whiting Milk Co., Elm Farm Milk Co. division, 158 Massachusetts Avenue, Cambridge, Mass., is taking bids for a one-story, 26 x 40 ft. forge shop to cost \$8,000. Plans are private.

New bids will be asked next spring by the National Can Co., 33 North Washington Street, Boston, for its contemplated plant, one-story, 120 x 160 ft., on Locust and Von Hillern Streets, Dorchester. Kroky & Brown, 7 State Street, Boston are the architects.

Pneumatic equipment is required by John M. Pinardi, 1062 Gorham Street, Lowell, Mass., stone cutting. A one-story, 49 x 70 ft. plant will be erected.

Foundations are in for a one-story, 26 x 75 ft. grinding plant for the Holtzer-Cabot Electric Co., 125 Armory Street, Jamaica Plain, Boston. Samuel D. Kelly, 46 Cornhill, Boston, is the architect.

Bids have closed on a three-story, 230 x 232 ft. high school, to be erected on Tudor Street, Chelsea, Mass., by that city. It will cost \$700,000 and will contain a machine shop and manual training departments. S. S. Eisenberg, 46 Cornhill, Boston, is the architect.

The Wheeler Mfg. Co., New Haven, Conn., capitalized at \$50,000, recently organized, has leased approximately 10,000 sq. ft. floor space for the manufacture of stainless steel cutlery. Grinding and other equipment will be required. Gardner E. Wheeler, general manager Wheeler Radiator & Mfg. Co., Cleveland, is president.

An item in the issue of Dec. 27 of THE IRON AGE mentioning the dissolution of the Middlesex Machine Co., Inc.,

failed to include the statement that the assets and liabilities of this company have been taken over by the New Haven Sherardizing Co., Hartford, Conn. The grinding machines formerly made by the Middlesex Machine Co. are now being produced by the New Haven Sherardizing Co.

The Progressive Mfg. Co., Torrington, Conn., manufacturer of machine bits and bolts, etc., has awarded contract for the erection of an addition, 163 x 181 ft., to cost \$15,000.

The P. & F. Corbin Division of the American Hardware Co., New Britain, Conn., will soon start work on alterations to building 99 to cost \$60,000. C. H. Norris, factory engineer, has prepared the plans.

The Draper Corporation, Hopedale, Mass., manufacturer of textile machinery, has plans for a new power house, to cost \$75,000. John A. Stevens, 8 Merrimack Street, Lowell, Mass., is engineer.

Bids will be taken at once by the Supply Officer, Navy Yard, Boston, for 36 high speed reamers, N. S. A. F. req. 313.

The Gong Bell Co., East Hampton, Conn., manufacturer of mechanical and other toys, has acquired the business of the Watrous Mfg. Co., manufacturer of kindred products and will merge the property. The purchased plant will be operated as a branch works. V. S. Purple is president.

The Progressive Mfg. Co., Torrington, Conn., manufacturer of machine screws, rivets, etc., has awarded a general contract to the Torrington Building Co., for a one-story addition, 163 x 181 ft.

The New England Explosives Co., Edward L. Fenn, Wood Street, Lexington, Mass., president, has tentative plans for a new plant at Portland, Me., estimated to cost \$75,000, with machinery.

The Granite Railroad Co., Quincy, Mass., has rejected bids recently received for its new compressor plant to cost about \$25,000, and will take other estimates later. D. D. Merrill, 5 Beekman Street, New York, is engineer.

The Autoyre Mfg. Co., Oakville, Conn., manufacturer of wire products, metal stampings, etc., will soon take bids for a four-story addition, 60 x 140 ft., to cost close to \$90,000. The Fletcher-Thompson Co., Bridgeport, Conn., is architect and engineer.

The American Electrical Works, Inc., Phillipsdale, R. I., manufacturer of wire, cables, etc., has awarded a general contract to Stone & Webster, Inc., 147 Milk Street, Boston, for a one-story addition, 80 x 275 ft., to cost \$100,000.

Griffith, Kiever & Co., 118-24 Western Avenue, Brighton, Boston, will install a planer, band and circular saws, sander, matcher and other wood-working machinery in its one-story addition, for which plans have been filed. It will cost about \$35,000.

Chicago

CHICAGO, Jan. 7.

WHILE the first week of the new year was not particularly active, the business outlook is regarded as favorable in view of numerous pending inquiries. Store trade shows some improvement and scattered sales of individual machines have been in fair number. Recent sales of this type by one dealer included two 14-in. x 6-ft. engine lathes, a motor-driven disk grinder, a hand milling machine, a 16-gage 6-ft. squaring shear, a used 28-in. x 8-ft. engine lathe and a used 14-in. x 8-ft. engine lathe. The Pullman Co., Chicago, has closed for a used 42-in. x 42-in. x 12-ft. planer.

The Standard Oil Co. of Indiana has entered the market for several drill presses, radial drills, planers and boring mills to replace equipment destroyed by a fire at its Whiting, Ind., shops on New Year's day. All of the machines to be bought will be direct-connected motor-driven tools. The Western Electric Co. has recently made liberal purchases of special manufacturing equipment for its new Kearny, N. J., plant, and has also bought a few machine tools, among them 16-in., 18-in., and 20-in. geared head-motor-driven engine lathes and a 20-in. motor-driven shaper. The Union Pacific has added a 72-in. x 72-in. x 20 ft. planer to its Los Angeles list, which was published in THE IRON AGE of Dec. 13. None of the machines on this inquiry has yet been placed. An important local manufacturer contemplates the purchase of from 15 to 20 miscellaneous machines.

The Great Northern Railway, F. A. Bushnell purchasing agent, St. Paul, Minn., has sent out an inquiry for seven machines as follows:

One 48-in. bevel-gear type boring mill with two heads on cross rail, belt driven.

One 3000-lb. single-frame steam hammer.

One 48-in. heavy-duty car-wheel boring mill, table 54-in. diameter, to take wheels up to 48 in. in diameter, motor driven.

One 9-ft. radial drill, motor driven.

One horizontal punch with 30-in. throat, motor driven.

One 1½-in. double-head bolt cutter, motor driven.

One alligator shear, capacity to cut 2-in. rounds, motor driven.

The Perfection Truck Co., 531 Lyndale Avenue North, Minneapolis, Minn., recently organized, is manufacturing commercial vehicles by contract and assembling them. It is in the market for small machine tools and equipment necessary for assembling work. The company is constantly in the market for motors, axles, transmissions and all parts pertaining to motor trucks. H. S. Saltzman heads the company.

The Chicago Fire Brick Co., 133 West Washington Street, Chicago, is inquiring for two 150-hp. horizontal, or two 250 to 300-hp. water tube boilers, 175-lb. pressure. W. D. McVey is purchasing agent.

The Whiting Corporation, Harvey, Ill., has taken the following orders for foundry equipment: A No. 7 cupola for the Birmingham Stove & Range Co., Birmingham, Ala.; a No. 3 cupola for the Lundin & May Foundry, Salt Lake City, Utah; a No. 9½ cupola for the Gurney Heater Co., Boston, Mass.; six 36-in. x 48-in. tumbling barrels for the Central Malleable Castings Co., Franklin Park, Ill.; three No. 10 cupolas for the Standard Sanitary Mfg. Co., Pittsburgh, and a No. 0 cupola for E. A. Barfield, Macon, Ga.

The Des Moines Electric Co., Des Moines, Iowa, has purchased ground and will start work immediately on the construction of an electric generating station to cost \$16,000,000 and to have an ultimate capacity of 175,000 hp.

The Public Service Co. of Northern Illinois has completed the first unit of a large electric generating station at Waukegan, Ill. This unit, which has been put into operation recently, generates 25,000 kw. The company now is making arrangements to start the construction of a second unit, which will generate 35,000 kw.

The American Sanitary Mfg. Co., Abingdon, Ill., has purchased the Northern Brass Mfg. Co., Waukegan, Ill., and will move the business to Abingdon. The facilities of the Abingdon plant will be doubled and the capital investment will be increased from \$250,000 to \$500,000. The company manufactures all brass fixtures used in plumbing.

The Galesburg Machine Works, Galesburg, Ill., is constructing a plant addition.

The G. & W. Electric Specialty Co., Inc., now at 7440 South Chicago Avenue, Chicago, has purchased a site between Anthony, Kenwood and Kimbark Avenues for a new plant. Work will probably start in 1925 on the first unit, to cost \$60,000.

One of the buildings of the plant of the International Car Co., Forty-third and Lincoln Streets, Chicago, was recently destroyed by fire. Damage was estimated at \$100,000. The company builds and repairs freight cars.

The Ever-Grip Wrench Co., 129 South La Salle Street, Chicago, recently incorporated with \$30,000 capital stock, will manufacture a complete line of nut and pipe wrenches and has a plant at 4711 West Lake Street, 50 x 125 ft. Until the plant is able to get into quantity production it will be impossible to estimate the number of machine tools which will be required. At present the company has sufficient equipment to manufacture from 300 to 500 wrenches per day. The officers are R. L. Evans, president; M. B. Hitchcock, vice-president; H. S. Coffins, treasurer, and A. J. Laverty, secretary.

The Steam Vacuum Washer Co., 337 West Madison Street, Chicago, recently incorporated with \$20,000 capital stock, is having laundry machines manufactured for it under contract.

The Meissner Mfg. Co., 618 Sherman Street, Chicago, recently incorporated with \$15,000 capital stock, has leased 5000 sq. ft. of floor space at the address given and is manufacturing automatic coil winding machines. It is also doing winding and manufacturing electrical equipment under contract. It is not in the market for metal working tools at present. Officers are: President, W. O. Meissner; vice-president, J. T. Watson; treasurer, E. C. Pierce; secretary, R. T. Brengle.

The Sun Radio Co., 4884-90 North Clark Street, Chicago, has leased temporary manufacturing quarters at the address given and is making radio receivers and equipment. It will require engine lathes, drill presses and other equipment. Officers are: President, H. F. Gay; vice-president, Anatol Golos; secretary and treasurer, R. R. Howard.

The Villet Magneto Co., 2445 Wabash Avenue, Chicago, has awarded contract for a one-story repair shop, 50 x 96 ft., to cost \$15,000.

C. E. Johnson, 8131 South Carpenter Street, Chicago, will build a one-story welding shop, 9363 Ewing Avenue, to cost \$10,000.

The Crown Die & Tool Co., 555 West Monroe Street, Chicago, has awarded a contract for a one-story plant, 80 x 125 ft., at 4200-14 Drummond Place, to cost \$17,000.

The Viking Pump Co., Cedar Falls, Iowa, is having plans prepared for a two-story addition, 66 x 135 ft., estimated to cost \$50,000. H. B. Burr, Commercial Bank Building, Waterloo, Iowa, is architect.

The Northern Pacific Railroad Co., Fifth and Jackson Streets, St. Paul, Minn., will commence the construction of new locomotive repair shops at Brainerd, Minn., and power house, to cost about \$600,000 including equipment.

The South Dakota State Cement Commission, Rapid City, S. D., C. A. Hunt, secretary, has preliminary plans for a new cement mill for State service on local site, to cost close to \$90,000 with equipment.

The Nebraska Power Co., Omaha, Neb., has plans for a one-story service, repair and storage building, 115 x 265 ft., at Forty-third and Worth Streets, to cost about \$160,000 including equipment. Frederick S. Stott, Kennedy Building, is architect. J. E. Davidson is general manager.

The Common Council, Owatonna, Minn., has preliminary plans for a new municipal power plant and system, to cost about \$350,000, and will take bids early in the spring. A. L. Mullergren, Gates Building, Kansas City, Mo., is engineer.

The Rapid City Packing Co., Rapid City, S. D., has plans under way for a new ice and cold storage plant, 45 x 80 ft., estimated to cost \$70,000, for which bids will soon be asked. James C. Ewing, Rapid City, is architect.

Milwaukee

MILWAUKEE, Jan. 7.

INTERESTING developments that promise a fairly active trade in machine tools and general metal-working equipment in the coming three to six months grew out of the dullness during the holiday season. Inquiry relating to some of the prospective needs is being put forth, although the major share of the requirements awaits maturity. One of the largest orders upon which estimates are being taken is the equipment for a branch plant to be established March 1 at LaCrosse, Wis., by the Milwaukee Corrugating Co., manufacturer of metallic building products. Numerous concerns have effected capital stock increases to cover growth of assets and proposed extensions. The trade in general feels that the opening of the new year has been accompanied by most encouraging signs of business improvement.

The Inland Steel Co., Chicago, is concluding negotiations for the purchase of the Milwaukee Rolling Mill Co., Milwaukee, for approximately \$2,000,000. It is proposed to enlarge the present plant, which has an annual capacity of 60,000 tons of black and galvanized sheets, with 10 sheet mills, five galvanizing pots, cold rolling and other equipment. Considerable of the output is absorbed by the Milwaukee Corrugating Co., which is about to establish another branch factory in LaCrosse, Wis., increasing its capacity from 35 to 50 per cent.

Peter Pirsch & Co., Kenosha, Wis., manufacturers of horse-drawn fire apparatus and fire-fighting units for motor truck chassis, let contracts Dec. 31 for a one-story steel and concrete factory addition, 100 x 200 ft., estimated to cost \$100,000, including additional equipment for which inquiry is being made.

The Appleton Wire Works Co., Appleton, Wis., manufacturer of wire cloth and screens for paper and pulp mills and similar purposes, has been reincorporated in Wisconsin as the Appleton Wire Works, Inc., with a capitalization consisting of \$525,000 preferred stock and 6300 common shares without par value, compared with \$150,000 capital of the original corporation. Plans for material enlargement of the production are reaching maturity. G. E. Buchanan is secretary-treasurer and general manager.

The Milwaukee Corrugating Co., Milwaukee, manufacturer of corrugated sheet metal and metallic building products, with a branch factory at Kansas City, Mo., has purchased three buildings with 150,000 sq. ft. of floor space from the Gund Brewing Co., LaCrosse, Wis., and will start work immediately on the conversion of the structures into a factory requiring a full complement of new machinery, with individual electric motors. Opening of the new branch plant is scheduled for March 1 or 15. August J. Luedke is secretary and treasurer.

The Kohler Co., Kohler, Sheboygan County, Wis., has awarded the general contract to the Immel Construction Co., Fond du Lac, Wis., for erecting a foundry and core-room addition, 60 x 180 ft., and a cleaning room, 190 x 300 ft., equipment for which is to be purchased within 60 days. The Kohler Co. manufactures enameled bathtubs, lavatories, etc., and also makes a self-containing generating system for farms and other isolated places. Walter J. Kohler is president and general manager.

The Auto Service Tool Co., South Milwaukee, Wis., has been incorporated with 2000 common shares without par value by Lem E. Hendee, 2435 Grand Avenue, Milwaukee, to manufacture special mechanics tools. R. M. Osterlah and C. J. Lemont are interested in the enterprise.

The Kawneer Mfg. Co., Niles, Mich., manufacturer of copper store fronts, metal products, etc., has placed the general contract with the Robert L. Reisinger Co., 464 Oakland Avenue, Milwaukee, for three new buildings estimated to cost \$150,000, and consisting of a manufacturing building, 53 x 189 ft. with a wing, 48 x 60 ft.; an assembling and finishing building 47 x 133, with a wing, 47 x 60 ft., and a two-story warehouse and storage building, 106 x 212 ft. Considerable new equipment will be required.

The Milwaukee Air Power Pump Co., 8 to 12 Keeffe Avenue, Milwaukee, expects to let contracts Jan. 15, for the erection of a two-story shop addition, 40 x 60 ft. The present shop was completed two years ago. The new work is in charge of Erich G. Schroeder, engineer and contractor, 405 Broadway, Milwaukee.

The Republic Match Co., Marinette, Wis., will install a number of additional machines with electric motor drive for the production of so-called parlor matches. At present it manufactures only safety matches. A contract has been closed for its entire output for a 10-year period.

The trustees of the Milwaukee Public Museum, Dr. S. A. Barrett, secretary, is asking bids until Jan. 21, for furnishing and installing one horizontal poppet valve uniflow engine and a direct current generator.

The Freeman Sons Mfg. Co., Racine, Wis., manufacturer of boilers, sheet and plate work, is buying a small list of miscellaneous equipment to handle a contract with the United Engine Co., Lansing, Mich., to manufacture manure spreading machines at the rate of 300 monthly during 1924.

The Common Council of Phillips, Wis., is taking bids until Feb. 1, for the following equipment for a new municipal water works plant: One 300-gal. per min. centrifugal pump with a 440-volt electric motor; one 1250-gal. per min. centrifugal pump, motor-driven, with pulley for oil engine standby; one 150-hp. oil engine, and a 100,000-gal. steel tank mounted on a 90-ft. steel tower. Frank Henry, local consulting engineer, is in charge of the work.

Harry E. Weber, Inc., 582 Jefferson Street, Milwaukee, has engaged Van Ryn & DeGelleke, architects, 114 Grand Avenue, local, to design a one-story fire proof building, 120 x 128 ft. for manufacturing and wholesaling and servicing automotive accessories, electrical equipment, etc. Bids on the general contract will be taken Jan. 14.

The DePere, Wis., Board of Public Works has let contracts for additional water supply and is framing specifications calling for two airlift pumps, one centrifugal pump and oil engine, with accessories. W. G. Kirchhoffer, Madison, Wis., is consulting engineer.

The Milwaukee Die Casting Co., 297 Fourth Street, Milwaukee, has increased its capitalization from \$75,000 to \$150,000 and contemplates expansion of its business which will embrace some additional equipment purchase within a short time. No building operations are under consideration at present.

The Wisconsin Iron & Wire Works, Inc., 1660 Booth Street, Milwaukee, has amended its articles to provide for an increase in capital from \$80,000 to \$200,000, part of which will be used for extensions, details of which are not yet available.

The Board of Education, Mayville, Wis., will close bids Jan. 22 on the erection of a \$250,000 high school with industrial training departments. It will be 75 x 160 ft., two stories and basement, with a one-story auditorium and gymnasium annex, 80 x 210 ft. The architects are Parkinson & Dockendorff, LaCrosse, Wis. O. D. Naber is chairman building committee.

Indiana

INDIANAPOLIS, Jan. 7.

FIRE Jan. 1, destroyed a portion of the refinery of the Standard Oil Co. of Indiana at Whiting, Ind., with loss estimated at \$800,000 including equipment. The machine shops and power house were destroyed. It is planned to rebuild. Headquarters of the company are at Indianapolis.

Bids will be received by the Bloomington Water Co., Bloomington, Ind., until Jan. 29 for two electric-driven centrifugal pumps and auxiliary equipment, each with capacity of 1,500,000 gal. per day, in connection with extensions and improvements in the local waterworks. Plans and specifications at the office of Pearse, Greeley & Hansen, 39 West Adams Street, Chicago, hydraulic engineers. U. S. Hanna, secretary of water company.

Charles P. and Harold Sindlinger, Shelbyville, Ind., are having plans drawn for a new one-story cold storage plant, estimated to cost \$40,000 with equipment, of which a list will soon be prepared.

The Erie Railroad Co., 50 Church Street, New York, is planning for new shops and terminal near Hammond, Ind., to cost approximately \$500,000. Buildings will be erected both for locomotive and car repair work including power house and turntable. A coal storage plant will also be built with mechanical loading equipment.

Henry Roeber, South Bend, Ind., engineer, is perfecting plans for a new works at New Paris, Ind., for the manufacture of iron and steel products, estimated to cost \$35,000. A company will be organized, it is stated, to operate the works.

The International Printing Co., Indianapolis, manufacturer of paper boxes and containers, has negotiations under way for the purchase of the former plant of the Lafayette Motors Corporation, Mars Hill, for \$150,000. The purchasing company will remodel the structures and remove its works at 230 West McCarty Street to the new location. Considerable additional machinery will be installed. Edwin A. Hunt is president and George K. Henderson, secretary and treasurer.

The Sinclair Motors, Inc., Indianapolis, recently organized, represented by Herbert Scheel, Tenth Street and Capitol Avenue, has preliminary plans for the establishment of a assembling works with initial capacity of about 25,000 cars per year. The company will manufacture a new four-cylinder automobile, to sell for about \$550.

A reorganization of the Western Drop Forge Co., Marion, Ind., as the Marion Forged Products Co. has been effected and operations will be resumed about Feb. 1. This company was one of the R. L. Dollings Co. subsidiaries. As a source for working capital \$125,000 in 5-year 7 per cent bonds is being issued. The new concern will manufacture forgings of carbon and alloy steels, brass, bronze, copper and aluminum, also a line of finished wrenches, chain pipe vises, hooks, clamps, etc. Officers are Frank W. Trabold, president; Robert W. Batton, vice-president; J. Mack Wilson, secretary; Fred W. Davis, treasurer.

The Showers Brothers Co., Bloomington, manufacturer of furniture, is planning extensions and improvements which will total approximately \$500,000. The program includes the construction of a central power plant, to cost about \$250,000, and a new chair factory. New dry kilns are now being built.

Detroit

DETROIT, Jan. 7.

OFFICIALS of the Maxwell Motor Corporation, Oakland Avenue, Detroit, have organized the Chrysler Motor Corporation, to manufacture a six-cylinder automobile. The new company will commence operations in a portion of the plant of the Chalmers Motor Corporation, East Jefferson Street, and later proposes to build new works. Walter P. Chrysler and W. Ledyard Mitchell head the company.

The Continental Motors Corporation, 12801 East Jefferson Avenue, Detroit, manufacturer of automobile gasoline engines, has tentative plans for an addition to its works at Muskegon, Mich. R. W. Judson is president.

The Means Stamping Co., Saginaw, Mich., recently organized, will establish a plant for the manufacture of metal stampings for automotive service. Ralph P. Means, formerly president of the Metal Goods Corporation, Buffalo, heads the new organization.

The Common Council, Marquette, Mich., will issue bonds for \$275,000 for the construction of a municipal electric power plant, for which bids will soon be asked. Orbison & Orbison, Appleton, Wis., are engineers.

The Pitman & Dean Co., Hastings and Trombley Avenues, Detroit, has plans for a new one-story ice-manufacturing and refrigerating plant at Mack Avenue and the Belt Line Railroad, 100 x 250 ft., estimated to cost \$200,000 with machinery. The George B. Bright Co., 103 Marquette Building, is architect.

The Grand Rapids Sash & Door Co., Grand Rapids, Mich., recently organized as a subsidiary by the Detroit Sash & Door Co., 5151 Loraine Street, Detroit, has leased the Silverman Building, Third and Dewey Streets, and will install equipment for a new plant. The company has also ac-

quired land at Third and Alabama Streets, 135 x 260 ft., and will erect a plant later.

The National Ice Co., 245 Congress Street, Detroit, will commence the erection of a one-story ice-manufacturing plant on Sterritt Avenue, estimated to cost \$50,000.

The Columbiaville Woolen Mills, Inc., Columbiaville, Mich., plans the construction of a power house in connection with the proposed rebuilding of its mill recently destroyed by fire with loss estimated at \$100,000.

The Reo Motor Car Co., Lansing, Mich., has awarded contract to the Christman Co. for a two-story addition, 63 x 150 ft. The company recently increased its capital from \$15,000,000 to \$20,000,000, and plans other expansion in the near future.

Edward Ver Linden, 5104 Burns Street, Detroit, has tendered an offer of \$250,000 for the plant and property of the Ryan-Bohn Foundry Co., Lansing, Mich., now in receivership, of which he was one of the original organizers. It is said that a new company will be organized, headed by Mr. Ver Linden, to operate the foundry in the future.

Hugh Lyons & Co., 700 East South Street, Lansing, Mich., manufacturer of motor truck bodies, etc., has tentative plans for a one-story addition, 60 x 200 ft., to cost about \$75,000, for which it is expected to take bids in March. A. E. Lyons is president.

The Kawneer Mfg. Co., Niles, Mich., manufacturer of metal store fronts, has awarded contract to R. Reisinger & Co., Oakland Avenue, Milwaukee, for several additions, 100 x 125 ft., 50 x 130 ft., each one-story, and two-stories, 100 x 210 ft., to cost about \$175,000.

The Kelly Valve Co., Muskegon, Mich., has sold its plant at the east end of the city to the Fitzjohn Irwin Mfg. Co., Muskegon Heights, manufacturer of automobile bus and commercial bodies. The purchaser will add to the plant to increase output 400 per cent or up to 80 bodies per month. The valve company will probably occupy a portion of the Enterprise Brass Co. plant or a part of the Michigan Washing Machine Co. plant at Muskegon Heights.

The Rafex Mfg. Co., Hudson, Mich., has been organized to manufacture fire extinguishers and chemical engines. While most of the parts will be built by contract, some machine work will be done in the company's shop. H. S. Graves, president, hopes that within a year the company will do all of its manufacturing.

The Opalume Sign System, Battle Creek, Mich., has been incorporated with \$40,000 capital stock to manufacture large electric signs. Data are being gathered for a factory to be built in the near future. H. G. Russell is general manager. The company is in production.

The Valley Steel Products Corporation, 759-60 Book Building, Detroit, incorporated with capital stock of \$25,000, will conduct a warehouse, handling new sheet and strip steel. A building has been leased at Vermont and Porter Streets. The company will soon be in the market for two squaring shears. S. M. Gerson is president.

Cleveland

CLEVELAND, Jan. 7.

A BRIGHTER outlook in the machine tool industry has come with the new year. A fair number of new inquiries developed during the week including one from the National Carbon Co. for 35 machines for its Cleveland and Long Island plants. Considerable business in the aggregate has come in the past two weeks in the automotive industry, purchases being made by the Ford Motor Co. and the Studebaker Corporation of Detroit, and the Olds Motor Works, Lansing, Mich. The White Motor Co., Cleveland, is buying a few additional tools. Some scattering inquiry is now pending from automobile companies for single machines or small lots to fill in present plant equipment. A Cleveland manufacturer has taken four large turret lathes for the Schenectady plant of the General Electric Co. Orders are still coming from the New York Central Railroad. It is estimated that this railroad has purchased about 75 per cent of the machinery called for in its recent lists.

The Monarch Machine Tool Co., Sidney, Ohio, has announced a 10 per cent advance on its line of lathes to become effective Jan. 15. A revised price list will be placed in effect on the same date by the National Automatic Tool Co., Richmond, Ind., maker of multiple spindle drilling machinery.

The inquiry from the National Carbon Co. includes the following:

One 24-in. planer
One 12-in. shaper
Two 16-in. shapers
Seven 12 to 24-in. tool room and engine lathes
Two plain milling machines
Three universal machines
One duplex milling machine
Two 20-in. drilling machines
One 14-in. drilling machine
One 8-in. drilling machine
Two surface grinders
One universal tool and cutter grinder
One twist drill grinder
Two floor grinders
One 4-ft. radial drill
One bench lathe
One hack saw.

The General Electric Co. has taken an order for a 30,000 kw. turbo generator for the East Seventieth Street plant of the Cleveland Electric Illuminating Co., a 1000 hp. motor for the Elyria Iron and Steel Co., which will change its present mill drive from steam to electricity, and a 300-hp. motor for driving the cold rolls at the plant of the Ashtabula Sheet Steel Co., Ashtabula, Ohio.

The Elwell-Parker Electric Co., Cleveland, has just received an order for eight lift trucks for the Southampton dock of the Southern Railway, England, and another order for three trucks for the South Victorian Railway in Australia.

The Advance-Rumely Co., La Porte, Ind., has taken over the business of the Aultman & Taylor Machinery Co., Mansfield, Ohio, manufacturer of agricultural machinery.

Schwenger & Klein, 5515 Denison Avenue, Cleveland, manufacturers of butchers' supplies and store fixtures, contemplate the erection of a \$10,000 machine shop addition.

The Chevrolet Motor Ohio Co., Toledo, Ohio, has under construction a one-story and basement addition, 130 x 200 ft.

A new senior high school including a manual training department will be built in Shelby, Ohio. R. L. Sawyer is clerk of the Board of Education.

The Ohio Confection Co., Warner Road, Cleveland, is planning a factory addition and boiler house. Equipment required will include 175 to 200-hp. boilers.

The National Ice Co., Toledo, Ohio, will build a \$250,000 ice-manufacturing plant. George Wright, 103 Marquette Building, Detroit, is the architect.

The Wood & Spencer Co., Cleveland, has added to its present products the manufacture of a complete line of standard and special taps. New equipment has been installed for this department.

The Hickox Production Co., Toledo, Ohio, operating an oil refinery on Richards Road, has plans for a new unit estimated to cost \$500,000 with machinery. A tract of three acres has been acquired. A. H. Hickox is head.

The McNeil Boiler Co., Akron, Ohio, wants one hydraulic stake riveter, for immediate shipment, also a 100-kw. generator, 220-volt, three-phase.

Pittsburgh

PITTSBURGH, Jan. 7.

THE first week of the new year has been dull in point of sales of machine tools and other equipment, but the local trade has such a large volume of inquiries upon which it is figuring that there is a very cheerful feeling as to the immediate future. The list of 30 tools for the Standard Sanitary Mfg. Co. for its new plant in Baltimore is the largest pending business and will likely be closed within the next few weeks. A list of 18 tools for the new shop of the Pennsylvania Railroad at Sharpsburg, Pa., also is looked upon as an early prospect.

There are few steel companies in this and nearby districts which are not at least figuring on plant extensions or betterments. Crane awards have been few, but there is an imposing list of inquiries against which orders are expected before long.

Tentative plans are under advisement by the New York Central Railroad Co., New York, for rebuilding the portion of its repair shops, forge and woodworking shops at Clearfield, Pa., recently destroyed by fire with loss estimated at \$100,000 including equipment.

Manual training equipment will be installed in the three-story and basement high school to be erected at Clairton, Pa., estimated to cost \$350,000, for which bids will be re-

ceived on a general contract until Jan. 18. Charles W. Bates, 77 Twelfth Street, Wheeling, W. Va., is architect.

The Phillips Mine & Mill Supply Co., 2227 Jane Street, Pittsburgh, will commence rebuilding the portion of its plant on Mary Street recently destroyed by fire. The initial work will cost close to \$40,000. Additional equipment will be installed.

The Gulf Oil Corporation, Frick Annex, Pittsburgh, operating oil properties and refinery at Port Arthur, Tex., is disposing of a bond issue of \$16,000,000, a portion of the proceeds to be used for extensions.

The Sterling Coal Co., Bakerton, Pa., has plans for a two-story and basement mechanical works, including forge and machine shops, to cost about \$150,000 including equipment. C. E. Schlicher, Spangler, Pa., is architect and engineer.

Fire, Dec. 27, destroyed a portion of the sash and door plant and other portions of the mill of the Johnstown Planning Mill Co., Johnstown, Pa., with loss estimated at \$50,000 including machinery. It is planned to rebuild.

Fire, Dec. 27, destroyed a portion of the plant of the Darlington Clay Products Co., Darlington, Pa., with loss estimated at \$150,000 including machinery and power equipment. It is planned to rebuild.

The Penn-Overland Co., 713 Railroad Street, Johnstown, Pa., local representative for the Overland automobile, will take bids for a two-story and basement service and repair building, to cost about \$65,000. C. M. Singiser, Commerce Building, Altoona, Pa., is architect. K. N. Cougeon is head.

The Ideal Mfg. Co., P. O. Box 947, Charleston, W. Va., recently organized to manufacture coal-loading machinery and devices, has plans for the establishment of an assembling works, and will defer the erection of a complete manufacturing plant. The company is interested in locating suitable plants to handle the production of parts, including small double-drum electric hoists, self-propelling carriages, gears, etc. John G. Dulmer is president and general manager.

The Federal Electric & Radio Corporation, Park Building, Pittsburgh, J. E. Mair, head, has preliminary plans for a one-story factory, estimated to cost \$40,000 with equipment.

Fire, Jan. 1, destroyed a portion of the machine shop and foundry of the Barnhart-Davis Foundry Co., Warren, Pa., with loss estimated at \$50,000 including equipment. It is planned to rebuild.

The West Penn Co., West Penn Building, Pittsburgh, has acquired the Clarksburg Gas & Electric Co., Clarksburg, W. Va., and vicinity. Extensions will be made, including power and transmission equipment, and the property connected with the system of the purchasing company. A. M. Lynn is president.

The Pure Oil Co., Gasco Building, Columbus, Ohio, has preliminary plans for rebuilding its refinery at Cabin Creek, W. Va., recently destroyed by fire with loss of \$100,000, and for an addition for considerable increase in former capacity.

St. Louis

ST. LOUIS, Jan. 7.

PLANS are being perfected by the Westinghouse Electric & Mfg. Co., East Pittsburgh, for a three-story addition to its factory branch at 717 South Twelfth Street, St. Louis, estimated to cost \$160,000.

Frank Kerr, Ash Grove, Mo., and associates are completing negotiations for the purchase of the local electric power plant. Extensions are planned and the installation of additional equipment. It is also proposed to construct an ice-manufacturing plant on adjoining site.

The Western Terra Cotta Co., Kansas City, Kan., has plans for a new factory, 65 x 80 ft., for the manufacture of terra cotta shapes, adjoining the present works at First and Franklin Streets.

Bids are being asked by the Dean Rubber Co., Thirteenth and Chestnut Streets, Kansas City, Mo., W. J. Dean, president, for the erection of its proposed one and two-story plant, 90 x 100 ft., North Kansas City, estimated to cost \$50,000.

The Southwestern Serum Co., 308 East Twenty-first Street, Wichita, Kan., will erect a two-story ice and cold storage plant, 50 x 80 ft., to cost approximately \$45,000.

The Board of Public Service, City Hall, St. Louis, plans the installation of triple expansion pumping engines, with capacity of 100,000,000 gal. per day, at the waterworks in connection with proposed extensions for which a fund of \$12,000,000 is available. Edward E. Wall is water commissioner.

The Roxana Petroleum Corporation, Arcade Building, St. Louis, plans the construction of two additional units at its new oil refinery at Arkansas City, Ark., recently placed in service. The expansion will cost in excess of \$150,000.

The St. Louis Terra Cotta Co., 5811 Manchester Avenue, St. Louis, will have plans ready in the near future for a one-story addition at 4417-31 Oleatha Avenue, with power department, estimated to cost \$100,000 including equipment.

The Arkansas Granite Co., Little Rock, Ark., recently organized with a capital of \$150,000, will install a plant on neighboring properties, where 275 acres have been purchased, to include jack hammers, air compressors, channeling machine, two 20-ton derricks, hoisting equipment, etc. W. T. Barr is president.

The Ford Motor Co., Highland Park, Detroit, has awarded a general contract to the J. R. Van Sant Construction Co., Dwight Building, Kansas City, Mo., for a one-story addition, 200 x 880 ft., to its local assembling plant on Winchester Avenue, including remodeling of the existing works, estimated to cost \$600,000. Albert Kahn, 1000 Marquette Building, Detroit, is architect.

The Common Council, Russell, Kan., plans the installation of electric pumping machinery at its proposed waterworks, to cost \$95,000. J. W. Murphy is city clerk.

The Diamond Wood Heel & Mfg. Co., 407 South Broadway, St. Louis, has awarded a contract to the Pollman Construction Co., St. Louis, for a two-story and basement plant, 75 x 170 ft., estimated to cost \$75,000 with machinery.

The La Crosse Lumber Co., Clarksville, Mo., plans to rebuild the portion of its mill and power house destroyed by fire Dec. 29 with loss estimated at \$50,000 including equipment.

The Leggett & Platt Co., 219 West Second Street, Carthage, Mo., manufacturer of bed springs, has engaged Percy K. Simpson, Center Building, architect, to prepare plans for a one-story and basement factory, 80 x 400 ft., to cost \$50,000 with machinery.

Cincinnati

CINCINNATI, Jan. 7.

THE year opened auspiciously for the machine tool industry, and several good orders have already been placed. Buying from the automotive industry continues in fair volume, and it is reported that the Ford Motor Co. has placed orders for approximately 60 special machines, 50 of which have been placed locally. The Buick Motor Car Co. is buying to replace worn-out machinery and to round out equipment. Industrial purchasing is also in fair volume, the General Electric and Westinghouse interests both having placed orders. Some of the larger steel mills are asking for bids on miscellaneous tools.

Railroad business is promising. The Southern Railway has placed orders for approximately 25 tools and will likely buy the remainder on its list this week. The Union Pacific Railroad is also expected to close this week and has issued an additional list for tools for early closing. The Big Four Railroad is taking bids on a number of engine lathes for Beech Grove shops. The Southern Railway, in addition to its recent purchases, is understood to be preparing a list of tools and other equipment involving an expenditure of \$800,000. The Louisville & Nashville Railroad is also understood to be preparing a list for a new shop to be built at Etowah, Tenn. Orders are expected to be placed by the Rock Island Railroad on an old list, part of which was recently closed, and the New York Central is expected to be a heavy buyer in the immediate future. A number of inquiries are current for export to Japan, but orders are not expected to develop in the immediate future.

The Flintex Corporation, Cincinnati, has been organized with a nominal capitalization of \$500 and will manufacture battery boxes of a composition type. The company has awarded contract for a plant at Norwood Heights, which is expected to be completed about March 15. Machinery, including mixing machinery and presses, has been purchased. Power plant equipment has also been purchased. Temporary offices of the company are at 702 First National Bank Building, Cincinnati. Dr. W. H. Clements heads the company.

The Thomas Corcoran Lamp Co., Spring Grove Avenue, Cincinnati, will build an addition to its plant which will enable it to practically double its present capacity in the production of automobile lamps and spotlights. The company has disposed of its plants in other

sections of the city and will concentrate its efforts in the main works. T. J. Corcoran heads the company.

The Crosley Mfg. Co., Cincinnati, manufacturer of radio sets and parts, has purchased the plant of the Corcoran Lamp Co., Colerain Avenue, and will occupy it on May 1. The building contains 85,000 sq. ft. of floor space and it is the intention of the company by greatly increasing its manufacturing facilities, to increase its output of radio sets to 5000 per week. The present plant of the Crosley Company will be maintained for the manufacture of parts. Powell Crosley is president.

The Cambria Clay Products Co., Blackfork, Ohio, has commenced construction on a brick and tile plant to cost, when completed, approximately \$500,000. Two hundred men will be employed.

The Lunkenheimer Co., Cincinnati, manufacturer of valves, will shortly call for bids for the erection of the second unit of its new plant at Carthage, 300 x 400 ft., of mill construction. Harry Hake, Cincinnati, is architect.

The Dayton Malleable Iron Co., Ironton, Ohio, will erect an addition to its plant, 60 x 200 ft., to be used as an annealing building.

The W. J. Hughes Co., Louisville, has tentative plans for rebuilding the portion of its lumber mill and power house destroyed by fire, Dec. 27, with loss estimated at \$350,000, including equipment and stock.

Bids will soon be asked by the Ford Motor Co., Highland Park, Detroit, for its proposed assembling plant on the waterfront at Louisville, recently acquired, estimated to cost \$750,000 with equipment. It is proposed to build a power house. Albert Kahn, 1000 Marquette Building, Detroit, is architect.

The Hardwick Stove Co., Cleveland, Tenn., has arranged a fund of \$500,000 for expansion, to include the erection of a one-story molding department, four-story mounting works and other structures to increase the capacity 50 per cent.

The Tennessee Enameling Co., Charl Park, Nashville, Tenn., is planning to rebuild the portion of its plant recently destroyed by fire. The new structure will cost approximately \$55,000. M. H. Wright is vice-president.

The Cleveland Chair Co., Cleveland, Tenn., has plans for a three-story plant, 80 x 100 ft., estimated to cost \$80,000 with machinery. John Milne is president.

The Southern Machinery & Foundry Co., Memphis, Tenn., has leased a one-story building, 60 x 95 ft., now in course of erection at 338-42 Adams Avenue, for a new machine shop and foundry.

Ovens, power equipment, conveying and other machinery will be installed in the three-story and basement baking plant, 90 x 264 ft., to be erected by the Holland Bread Co., Cannon Avenue, Toledo, Ohio, estimated to cost \$185,000. Bids will be asked about Jan. 15. Mills, Rhines, Bellman & Nordhoff, Ohio Building, are architects. Wade Holland is president.

The People's Ice & Storage Co., Toledo, Ohio, recently organized, has purchased property on Champlain Street, 100 x 138 ft., for an ice-manufacturing plant, estimated to cost \$150,000 with machinery, for which plans will soon be prepared. A. W. Kalb, Danberry, Ohio, is interested in the new company.

The Southern Railway Co., Southern Railway Building, Cincinnati, has plans for a one-story addition to its locomotive and car repair shops, 100 x 130 ft., at Ferguson, Ky., to cost about \$100,000 including equipment. Adam Ritter is company engineer.

The Louisville Gas & Electric Co., 311 West Chestnut Street, Louisville, is considering the construction of a repair works, storage and equipment distributing plant at Seventh and Dumesnil Streets, to cost about \$200,000 with material-handling and other machinery.

South Atlantic States

BALTIMORE, Jan. 7.

PROPERTY of the Acme Foundry Co., 308 North Henry Street, Brooklyn, N. Y., has been acquired by Levering Brothers, William Street and the Key Highway, Baltimore, manufacturer of sash weights and other iron castings, and will be remodeled for a branch plant.

Bids will be received by the Bureau of Supplies and Accounts, Navy Department, Washington, until Jan. 22 for rotary converters and spare parts for Eastern and Western navy yards, schedule 1733; until Jan. 22 for a miscellaneous quantity of twist drills for the Puget Sound yard, schedule 1729; until Jan. 15 for hot plates, boilers, etc., for the Quincy, Mass., and Camden, N. J., yards, schedule 1731; until Jan. 29 for miscellaneous steel wire rope for Eastern

and Western yards, schedule 1745; and until Jan. 29 for electrical equipment and supplies for Eastern and Western yards, schedule 1749.

The Common Council, Augusta, Ga., has tentative plans for a municipal electric light and power plant, to cost in excess of \$100,000.

The United States Auto Twin Hooks & Chain Co., Oakland, Md., recently organized with a capital of \$100,000, has completed negotiations with the local Chamber of Commerce for a site for a plant to manufacture skid chains. An existing works will be removed to this location and extended. The new company is headed by Charles N. McIntire and Henry C. Sincell, Oakland.

The City Council, Danville, Va., will enlarge the pumping plant of the municipal waterworks and install additional electric pumping machinery in connection with other extensions to cost \$150,000.

The Industrial Machinery Division, Bureau of Foreign and Domestic Commerce, Washington, has information regarding a company at Funchal, Madeira Islands, which plans to more than double the capacity of its concrete block manufacturing plant, installing American mixing, pressing and other machinery.

The General Purchasing Officer, Panama Canal, Washington, will receive bids until Jan. 14 for 48 engine lubricators, 624 grease cups, hoisting chain, and other equipment, circular 1582.

The Asheville-Overland-Knight Co., Inc., Ashville, N. C., representative for the Overland and Knight automobiles, is having plans drawn for a four-story service and repair building, estimated to cost \$300,000 with equipment. Smith & Carner, Asheville, are architects.

The C. A. Borchert Co., 127 Centre Street, Cumberland, Md., recently organized, has secured a building and will establish a plant for the manufacture of glass products. Cutting, power equipment and other machinery will be installed. C. A. Borchert is president.

J. H. Anderson, Route 4, P. O. Box 5, Camden, S. C., is planning the establishment of a local plant for the manufacture of concrete and cement bricks, blocks and kindred product and will purchase machinery.

The Bureau of Foreign and Domestic Commerce, Washington, has information regarding a company at Benoni, South Africa, in the market for American machinery for the manufacture of ventilators, lead-lights, etc., No. 8717; of a company at Adelaide, Australia, desiring to purchase machinery for a regrinding shop, No. 8724; a company at Montevideo, Uruguay, in the market for machinery to manufacture paraffin paper milk bottles and containers, No. 8742; a company at Port Elizabeth, South Africa, desiring to purchase machinery for the manufacture of metal window frames, No. 8594; a company at Bordeaux, France, desiring road building machinery and parts, No. 8606; a company at Panama, in the market for a gasoline or kerosene engine for power house service, No. 8704; and a company at Penang, Straits Settlements, in the market for hoisting winches for dredge work, No. 8614.

The Southern Power Co., Charlotte, N. C., has commenced the construction of a new steam-operated electric generating plant at Duncan, S. C., with initial capacity of about 37,000 kw. Contract has been awarded to the General Electric Co., for steam turbo-generators, and awards for other equipment will be made at an early date. William S. Lee, 511 Fifth Avenue, New York, is consulting engineer.

The Common Council, Hagerstown, Md., has been denied permission by the State Public Service Commission to issue bonds for \$300,000 for its proposed municipal electric power plant and the project will be held in abeyance.

Bids will be received by the Board of District Commissioners, District Building, Washington, until Jan. 25 for one motor-driven centrifugal pumping unit, capacity 3,000,000 gal. per 24 hr.

The Baltimore & Ohio Railroad Co., Baltimore, has plans for a two-story addition at its Mount Clare repair works, estimated to cost \$27,000. H. L. Kimball is company architect.

T. E. King, Springfield, Ga., machinery dealer, has inquiries out for one 100-hp. Corliss engine, to be delivered at Columbia, S. C.; one center crank, balanced valve engine, 15 x 16 in., or 14 x 18 in., for delivery at Denmark, S. C.; two 125-hp. horizontal return tubular boilers, 125 lb. working pressure; one 400 to 500-hp. closed type exhaust steam heater; 10 or more flat cars, about 36 in. x 25 ft., for logging service.

The Norfolk & Southern Railway Co., Norfolk, Va., has preliminary plans for the construction of a refrigerating and ice plant at Star, N. C. F. L. Nicholson is chief engineer.

The Everedy Co., Frederick, Md., recently formed with a capital of \$100,000, has acquired the local plants of the Everedy Bottle Capper Co. and the Sterling Plating Works.

Manufacture will be continued of metal bottle caps, capping equipment, etc. Plans are being considered for extensions and the installation of plating equipment. Harry J. Lebherz is head.

Merger plans have been arranged by the Potomac Public Service Co., Hagerstown, Md., and the Edison Electric Co., Cumberland, Md., under the name of the Potomac-Edison Co. Permission has been secured to issue bonds for \$750,000, a portion of the fund to be used for extensions in the plant and system of the Northern Virginia Electric Co., a subsidiary, and the purchase of additional equipment.

The White Furniture Co., Mebane, N. C., will erect a new one and two-story plant, 75 x 225 ft., to replace its factory recently destroyed by fire. A power house will also be constructed. The company is in the market for woodworking and other machinery, as well as a generator-set, boilers and auxiliary power equipment. W. E. White is president.

The Bedford Tire & Rubber Co., Bedford, Va., is arranging a fund of approximately \$100,000 for the construction of its proposed plant, 80 x 300 ft., of which \$70,000 will be used for the purchase of machinery and power equipment. It is purposed to develop an initial output of 1000 tires per day. The company was incorporated recently with a capital of \$1,000,000. J. J. Scott is secretary and treasurer.

The Black & Decker Mfg. Co., Towson, Md., has reduced prices on its $\frac{1}{8}$, $\frac{1}{4}$, $\frac{1}{2}$, $\frac{1}{4}$ and $\frac{1}{8}$ -in. heavy-duty portable electric drills approximately 12 per cent and also the prices on 4, 5 and 6-in. portable electric grinders the same amount. This is the second reduction made by the company the past year.

The Mallory Machinery Co., 522 Light Street, Baltimore, is inquiring for two 10 x 12-in. or larger second-hand steam hoists, without boilers; also two stiff-leg steel derricks, 40-ton capacity.

Czarra & Constantine, Hyattsville, Md., successor to a partnership by that name, will continue the manufacture of cement blocks. Plans provide for a new plant, construction work to be let. Equipment needed includes two hobb machines and four hobb strippers. S. A. Czarra is president.

The Gulf States

BIRMINGHAM, Jan. 7.

ABOUT 22 acres on Forest Avenue, Dallas, Tex., has been purchased by the Guilberson Corporation, Dallas, manufacturer of oil-well machinery, as site for a new plant. Plans will be drawn at once for two buildings, one for machine and mechanical work and the other for an office. Additional units will be built later. R. S. Hazeltine is vice-president and general manager.

The Knox Process Co., Texas City, Tex., has purchased 140 acres adjoining the plant of the Vacuum Oil Co. for a gasoline refinery to operate under a new process. The initial unit, including power house, will cost approximately \$500,000 with equipment. The plant will be expanded to six units later, with investment of \$2,000,000. Leonard Steerman, Houston, Tex., represents the company.

The Southern Mfg. Co., Gardner and Tenth Streets, Gadsden, Ala., is planning for an addition to its lumber mills, to be equipped as a milling plant, estimated to cost \$80,000 with machinery.

Traveling cranes, loading and unloading machinery and other material-handling equipment will be installed at the wharf and shed to be erected by the Board of Dock Commissioners, New Orleans, estimated to cost \$1,000,000. Similar equipment will be installed in the waterfront warehouse to be constructed on adjacent site by the Louisville & Nashville Railroad, Louisville, estimated to cost \$750,000.

The Houston Oil Co., Houston, Tex., has plans for a gasoline refinery at Camden, Ark., where district offices are maintained, with initial output of 5000 bbl. per day, to cost approximately \$750,000 including machinery. A power house will be built.

R. E. Lynch, Scooba, Miss., is planning the installation of an electric light and power house to replace that recently destroyed by fire.

The Common Council, Kerrville, Tex., plans the installation of an electric pumping plant at its proposed sewerage disposal works, estimated to cost \$78,000. The Municipal Engineering Co., Praetorian Building, Dallas, Tex., is engineer.

The Hugh Drane Ice Co., Athens, Tex., will commence the construction of an ice-manufacturing and refrigerating plant to cost \$55,000 including machinery.

The Board of Education, El Paso, Tex., is arranging a bond issue of \$800,000 for school expansion, of which \$170,000 will be used for a new vocational training school. Plans will be drawn in the near future. J. H. McBroom is president of the board.

The Southern Railway Co., Richmond, Va., has authorized plans for additions in its car and locomotive shops at Birmingham to cost \$500,000 with equipment. Dwight P. Robinson & Co., Inc., 125 East Forty-sixth Street, New York, is engineer.

The American Sulphur & Fertilizer Co., Pecos, Tex., has leased buildings in the Love Field industrial district, Dallas, Tex., and will install machinery and equipment for ore-crushing, sorting, etc. Later the company purposed to erect a new plant in this section to cost more than \$100,000 with equipment. J. A. Price is president.

The Souders & Fisher Co., Breckenridge, Tex., will commence the construction of a gasoline refinery on the Walker property, about 7 miles from the city, estimated to cost \$200,000 with machinery. A power house will be installed.

The Board of Works, Austin, Tex., will install an electric pumping plant at its proposed filtration works, to cost approximately \$300,000 with machinery.

The San Antonio Public Service Co., San Antonio, Tex., will make extensions in its steam-operated electric power plant on Villita Street, to cost \$150,000 including machinery. Machine guards and other protective devices will be installed. E. H. Kifer is president and general manager.

A power plant will be constructed at the proposed cotton mill to be erected at Omaha, Tex., by H. M. Farrier, local capitalist, and associates, estimated to cost \$250,000. A company will be organized to operate the plant.

The Common Council, Maybank, Tex., is perfecting plans for a municipal electric power plant to cost \$60,000.

Pacific Coast

SAN FRANCISCO, Jan. 2.

ASITE at Redondo Beach, Cal., has been purchased by the Kroyer Tractor Co., Stockton, Cal., for a new plant to manufacture farm tractors and parts, for which plans will soon be prepared. It will cost about \$90,000 with equipment. J. M. Kroyer is president.

The Morris Furniture Co., Los Angeles, has tentative plans for rebuilding the portion of its plant destroyed by fire Dec. 25 with loss estimated at \$100,000 including machinery.

The City Council, Walla Walla, Wash., is planning for a bond issue of \$750,000 for the construction of a municipal electric power plant and will soon call for bids.

The Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., will soon break ground for a three-story addition to its plant at Powell and Sixty-second Streets, Emeryville, Cal., to cost about \$300,000 including equipment. Bernard H. Prack, Emeryville works, is company architect.

The Balboa Motor Corporation, Fullerton, Cal., is having plans drawn for a group of plant buildings, with main structure one-story, 168 x 280 ft., for the manufacture of automobiles and parts. A power house will be built. The plant will cost \$150,000 with machinery. Hamm & Grant, 607 Ferguson Building, Los Angeles, are engineers.

The Pacific Furniture Co., Adams Wharf, Oakland, Cal., has purchased property at Oak and Third Streets for a new plant to manufacture fiber furniture, estimated to cost \$100,000 with machinery. E. W. Cannon, Central Bank Building, architect, will soon take bids. The company is affiliated with the Bemis-Riddell Fiber Co., Sheboygan, Wis., manufacturer of kindred products.

The San Diego Cotton Seed Oil Products Co., Chula Vista, Cal., has tentative plans for rebuilding the portion of its plant and power house recently destroyed by fire with loss estimated at \$350,000 including machinery.

The Blue Mountain Lumber Co., Union Junction, Ore., has preliminary plans for a new mill and power house estimated to cost \$150,000.

The Shell Oil Co. of California, 343 Sansome Street, San Francisco, is planning for the construction of a new oil storage and distributing plant at Harbor Island, Seattle, estimated to cost \$500,000 with machinery.

The Union Oil Co., Union Oil Building, Los Angeles, has tentative plans for a number of new units at its refinery on the Harbor Boulevard, including an asphalt refining works and loading dock, estimated to cost \$500,000 with equipment.

Charles Dunlay and R. C. Baker, Phoenix, Ariz., have purchased property at Grand Avenue and Ninth Street as a site for a new ice-manufacturing and refrigerating plant estimated to cost \$80,000.

The J. I. Case Threshing Machine Co., Portland, has plans for a new four-story factory branch on East Clay Street, 100 x 186 ft., estimated to cost \$105,000. Headquarters of the company are at Racine, Wis.

The Nims Pump Co., 444 North Madison Street, Stockton, Cal., manufacturer of circulating water pumps for automobile service, is having plans prepared for an addition.

The Terminal Ice & Cold Storage Co., Third and Hoyt Streets, Portland, will commence the erection of a three-story cold storage plant, 100 x 100 ft., estimated to cost \$80,000 including equipment.

Canada

TORONTO, Jan. 7.

Business is quiet, following the holiday season, but machine tool dealers are handling a large volume of inquiries which are expected to develop into sales within the next few weeks. Despite the fact that the past month was broken up with holidays, business booked was considerably above that of a year ago and December on the whole compared favorably with the previous month. Canadian railroads are preparing to enter the market for rolling stock, and much of that now in use will have to go to the repair shops, as a result a large volume of buying is expected on this account. The demand for small tools is showing signs of improvement and sales the past few days indicate a strong demand in the early future.

The Lee Puncture Proof Tire Co. of Canada, Ltd., Toronto, is making arrangements to erect a factory in Montreal for the manufacture of automobile tires, etc.

Estimates are being received by Mayor Farrell, Grimsby, Ont., on the cost of a hydro system for electric light and power distribution.

James Gordon Dunn, Jr., Huntington, Que., contemplates the erection of a power plant at Ste. Martine, Que., to develop 300 hp., work to start in the spring.

Construction has started on a \$3,000,000 dam and power plant at Cat Calumet Island Falls on the Ottawa River for the Ottawa River Power Co., Ltd., Montreal. Contract for generators has been awarded to the Canadian Westinghouse Co., Ltd., Montreal, to cost \$250,000. Dr. L. A. Herdt, of the company's staff, is receiving bids on the remainder of

electric machinery required. General contractors are Fraser Brace, Ltd., Montreal; engineers, William Kennedy & Sons, Ltd., 232 St. James Street, Montreal, and Dr. L. A. Herdt.

The plant of the Horton Steel Co., Bridgeburg, Ont., was recently destroyed by fire with a loss of \$75,000. Only the office building and an auxiliary plant some distance away from the main works were saved. It is the intention to rebuild immediately.

The Lundy Products Co., Dunnville, Ont., manufacturer of ornamental iron fencing, woodenware, etc., has awarded contract to Jean Bennett for the erection of a factory, to cost \$30,000, on the site of the Canadian Engines, Ltd., whose plant was recently destroyed by fire.

Fagan & Co., Northcott Building, Queen Street, Niagara Falls, Ont., will purchase machinery and equipment to manufacture wire for automobiles.

The Welland Steel Casting Co., Welland, Ont., will purchase special equipment for its plant. The company is at present installing an electric furnace.

The Bickle Fire Engine Co., Woodstock, Ont., will build an addition and is asking for metal working machinery, tools, etc.

Graham & Wilkinson, Spanish Station, Ont., are interested in the purchase of saw mill machinery.

R. T. Donaldson, Dixie, Ont., will purchase machinery for the manufacture of automobile radiator shutters.

The Consolidated West Dome Lake Mines, Toronto, is in the market for mining machinery and equipment. G. H. Manton, 420 Bank of Hamilton Building, Toronto, is purchasing agent.

The Middleton Town Council contemplates the installation of a power unit at Nictaux Falls, N. S., to cost \$20,000.

The Rudel-Belnap Machinery Co., 137 McGill Street, Montreal, is in the market for a used roll grinder, for rolls up to 30-in. diameter, 160-in. face.

Western Canada

R. H. Gales, president Terminal Grain Co., Ltd., Vancouver, B. C., has just returned from England, where he has obtained financial assistance for the construction of a \$2,500,000 reinforced concrete grain elevator the company proposes to build in Vancouver. It will have a capacity of 2,000,000 bu. and construction will soon start so as to have the plant in operation to handle this year's crop.

Plans of New Companies

The Blaisdell Compression Co., 227 Fulton Street, New York, incorporated with capital stock of \$25,000 to manufacture engines and kindred equipment, is now acting as designer and manufacturer of sugar machinery, air compressors and tanks. Manufacturing is being done through the Reading Iron Works, Reading, Pa., and the Harrisburg Mfg. & Boiler Co., Harrisburg, Pa. C. H. Stanton heads the company.

The Ganio-Kramer Co., New York, has been incorporated with capital stock of \$30,000 and will manufacture radio equipment by contract, confining its activities to assembling work. F. F. Ganio and H. Kramer head the company. Address 238 West Fifty-third Street.

The Automotive Muffler Corporation, New York, has been incorporated with 1000 shares of stock, no par value, to manufacture automotive equipment. It is now awaiting confirmation of patents. Manufacturing will be done by an outside concern. Address care of Mr. Wattenberg, Bennet & Wattenberg, 36 West Forty-fourth Street.

The Wilson Roller Bearing Corporation, 43 Alsop Street, Jamaica, L. I., has been incorporated with \$100,000 capital stock to manufacture roller bearings and kindred products. Its plant will be located at Long Island City and will be ready for operation, it is expected, within four months. Machinery and equipment will be installed, a considerable part of which has already been placed. F. E. and C. L. Wilson head the company.

Patriarche & Bell, Inc., 351 West Street, New York, have been incorporated with capital stock of \$150,000 to acquire the partnership by that name, which has conducted a warehouse business in special steels for many years. P. H. Patriarche is president and P. E. Bell is vice-president. No changes are contemplated in operation.

The Purco Steel Corporation, 127 Christopher Street, New York, recently incorporated with 1000 shares of stock, no par value, to manufacture iron and steel products, will erect a building at 792 Greenwich Street, which will be occupied

by the A. J. Purdy Co., jobber in the smaller sizes of steel. It is expected that the Purdy company will occupy the new building in June. Equipment will be installed which will enable the company to triple present capacity and to handle the larger sizes, including structural material. J. S. and A. R. Purdy and H. De Vos are the principals.

The Mauser Arms Co., New York, has been incorporated with capital of 200 shares of no par value stock to manufacture rifles. As closely as can be ascertained, the company will act as importer in this line for the present. Address is in care of H. H. A. Meyn, Erisson & Schenk, 50 Church Street.

The Pioneer Motor Bearing Co., 1271 Bedford Avenue, Brooklyn, has been incorporated with \$75,000 capital stock, acquiring a business established four years in manufacturing engine bearings, rods, crankshafts and brass shims for the automotive trade. Pure tin and sheet brass are used and the company is interested in surplus stocks of these. Main office and factory are at 800 Van Ness Avenue, San Francisco.

The Foley Saw-Tool Co., 3613 Portland Avenue, Minneapolis, Minn., organized with \$50,000 capital stock to manufacture saw sets and saw-fitting tools, plans to manufacture by contract until the middle of the year, when a factory will be completed and equipped. H. B. Foley heads the company.

The New Haven Auto Parts Co., 496-98 Orchard Street, New Haven, Conn., recently organized, will buy automobiles and salvage the parts. Louis Mershy heads the company.

The Lloyd Brothers Electric Appliance Co., St. Louis, recently organized, will act as jobbers in this line. Ben Lloyd, R. Lloyd and E. Tremain are the principals.

The B-Metal Refining Co., 1935 Hazelwood Avenue, Detroit, has been organized to manufacture radio specialties. The company is ready for operation. H. D. Stroud is president; T. M. Stroud, vice-president; F. G. White, secretary.

The Standard Pulley Co., 1734 Powers Street, Cincinnati, has been organized to manufacture cast iron pulleys and clutches, formerly manufactured by a company of the same name. It has a foundry equipped and ready for use, but expects to build a machine shop in the near future, and at that time equipment will be needed. Elmer R. Ritter is president and treasurer.

The Holland Mfg. Co., Holland, Mich., has been organized with \$25,000 capital stock and will manufacture electric cranes and presses for garage use. A building has been leased and some equipment purchased. Castings will be manufactured by contract. S. R. McLean is president and C. J. McLean, secretary-treasurer.

The Reed Auto Equipment Co., Box 444, Middletown, Ohio, has been organized with \$25,000 capital to manufacture shock absorbers formerly made by the Reed Mfg. Co. Work is done by contract. Eo Reed and L. E. Kittle head the company.

The Hygrade Mechanical Toy Mfg. Co., Brooklyn, has been incorporated with \$50,000 capital stock to manufacture mechanical toys. The company will operate an assembling plant, manufacturing to be done by contract. Address care of E. I. Gottlieb, 140 Nassau Street, New York.

The Bridgeton Industrial Development Co., Bridgeton, N. J., has been incorporated with \$50,000 capital stock to erect manufacturing plant, which in turn will be sold to operating companies. The first building has been contracted for and is now under way. When completed it will be occupied by the Penn Motors Corporation, Philadelphia. Victor Morvay is president; John M. Stiles, vice-president; B. B. Ware, treasurer, and D. V. Aitken, secretary.

The Marion Glass Dash Co., Eighth and McClure Streets, Marion, Ind., recently organized, will manufacture glass dash for finishing stucco cement blocks and asphalt shingles. Its plant is equipped and now in operation. William H. Jones is president; John E. Nelson, vice-president, and Frank W. Wimmer, secretary-treasurer.

The Sipe Conditioner Mfg. Co., 1053 St. Louis Avenue, Kansas City, Mo., has been organized to take over a company which has manufactured washing machines and kindred products since 1913. The company has plant and equipment sufficient for present needs. B. E. Sipe is president; A. B. Sipe, secretary, and C. O. Dinnnock, treasurer.

The Aetna Steel & Iron Co., Inc., Buckminster Hotel, Boston, has been organized with \$170,000 capital stock to manufacture iron and steel bars and shapes, also toe chalk. Mills are built and the company expects to be ready for operation about Feb. 1. Seth L. Martin is one of the principals.

The Keystone Sales & Mfg. Co., Box 806, Harrisburg, Pa., has been incorporated with \$50,000 capital stock to manufacture Bentz convertible tractor lugs. Castings and bolts are made by the Lancaster Foundry Co., Lancaster, Pa. Jesse L. V. Smith is president; F. R. Smith, vice-president, and John A. Bentz, secretary-treasurer.

The Connecticut Oil Heating Co., Hartford, Conn., incorporated with \$50,000, will act as distributor of automatic oil-heating equipment. Lawrence Davis is president.

The National Automatic Electric Appliance Co., City of Paris Building, San Francisco, has been incorporated with capital of \$50,000 to manufacture electrical equipment. It has a shop and equipment. Dr. W. F. Cutler heads the company.

The Western Iron & Steel Co., Detroit, recently incorporated, will operate the plant formerly owned by the Vassar Foundry Co., Vassar, Mich. For the present its activities will be limited to the production of gray iron castings, but the operation of a malleable foundry is also contemplated. Montgomery Whaling, Detroit sales representative Wickwire-Spencer Steel Corporation, is president of the new company.

Deepwater Oil Refineries, Inc., Houston, Tex., has been organized to take over the business and properties of the Deepwater Oil Refineries Co., which built a plant and started operations in 1920. No immediate expansion is contemplated. E. F. Harrell is assistant secretary.

Matteo E. Inflorati, chief engineer and assistant general manager of the J. N. Lapointe Co., Pequot Avenue, Buffalo, has resigned these positions and is organizing a company in Ohio to make special tools for the Ford Motor Co. Three other men from the Lapointe company are associated with him in the company, capital of which will be \$50,000.

The Jones Electric Corporation, Waco, Tex., has been incorporated with capital stock of \$100,000 to manufacture electric hair-cutting tools. Manufacturing is now done through the Doehler Die Casting Co. and others. Future expansion contemplates plant construction and large scale production, but this is remote. W. A. Parker is president; J. H. Lockwood, treasurer and S. P. Jones, secretary.

Trade Changes

The Edison Storage Battery Co. will soon occupy its new St. Louis plant at Vandeventer and Chouteau Avenues. This is the third building for the company since its St. Louis branch was opened in 1907, the steady growth of business in the territory necessitating still further enlargement. The new structure will have 32,000 sq. ft. of floor space.

The Armstrong Cork & Insulation Co., Pittsburgh, has moved its Minneapolis office to 316-20 Third Avenue, North, where larger quarters are available.

The Cleveland-Cliffs Iron Co. announces the removal of its offices from the Kirby Building to the Union Trust Building, Cleveland.

The business of G. Krug & Sons, manufacturers of ornamental builders' and miscellaneous iron work, fire-escapes, etc., 415-417 West Saratoga Street, Baltimore, and which has been conducted by Theodore F. Krug, has been transferred to Gustav F. Krug, who will continue the business under the same name.

The Kearney & Trecker Corporation, Milwaukee, has closed its Cleveland store at 738 Superior Avenue, Northwest, and has opened an office in the Penton Building, R. A. J. Wellington in charge.

Murphy Brothers, sheet metal contractors, 22 North Park Row, Erie, Pa., have discontinued their hardware lines and will devote all efforts to sheet metal work, roofing and furnace work, owing to increased activity in this department.

W. P. Snyder & Co., Oliver Building, Pittsburgh, announce the removal of their Cleveland office from the Kirby Building to the Union Trust Building.

The Cutaway Harrow Co., Inc., Haddam, Conn., hereafter will be known as the Clark Cutaway Harrow Co., Inc.

The C. A. P. Turner Co. announces the removal of offices from 627 First Avenue North to 300 Builders Exchange Building, Minneapolis, Minn.

The A-A Wire Co., Inc., has moved general sales offices to 110 East Forty-second Street, New York.

The Dale Machinery Co. has opened offices at 308-09 Machinery Hall, Clinton Street and West Washington Boulevard, Chicago, and has taken over exclusive representation in Chicago territory for the following lines: Boring machines,

Blomquist-Eck Machine Co., Cleveland; engine lathes, Lehmann Machine Co., St. Louis; steam hammers, Massillon Foundry & Machine Co., Massillon, Ohio; hand screw machines and stay bolt machines, Millholland Machine Co., Indianapolis.

The Victoria Metal Co., 832-40 East Eighth Street, Erie, Pa., has purchased outright the N. A. Watson Co., also of Erie, manufacturer of the Excelsior steam injectors and the Watson steam jet pump. All machinery and equipment will be moved to the Victoria plant, where these appliances will be manufactured with increased facilities. This addition to the plumbers' brass goods and steam fittings, now made by the Victoria company, has necessitated the purchase of considerable machinery.

C. L. Dewey, formerly vice-president and general manager of the Michigan City Foundry & Machine Company, Michigan City, Ind., has severed his connection with that company and moved to Elkhart where he has organized the Outing Mfg. Co. which will manufacture sporting goods.

Elwood Haynes, automobile manufacturer, will continue as president of the Haynes Automobile Co., Kokomo, Ind., under the new financing arrangement just completed. The Kokomo Chamber of Commerce conducted a campaign during the last three weeks for a \$1,000,000 bond issue to place the Haynes company on a sound financial basis. The issue was over-subscribed.

The Debevoise-Anderson Co., 53 State Street, Boston, has taken over the New England sales agency for Sloss-Sheffield pig iron.

The partnership heretofore existing under the name of Alley & Page, Boston and New York, dealing in pig iron, coke, etc., has been dissolved. The business hereafter will be carried on under the name Alley & Page, Inc. There is no change in the personnel of the concern, James C. Alley, New York, and Rufus W. Page, Boston, constituting the officers and stockholders.

The American Manganese Steel Co., Chicago Heights, Ill., has purchased the foundry of the Queen City Foundry Co., Denver, and plans to increase capacity and modernize the equipment. J. M. Blake, metallurgist, will be general manager. In addition, the company will be represented in Utah by Landes & Co., Salt Lake City; in New Mexico and Arizona by H. B. Wolcott, Jr., El Paso, Tex.; and by the A. T. Herr Supply Co., Denver.

STEEL AND INDUSTRIAL STOCKS

The range of prices on active steel and industrial stocks from Monday of last week to Monday of this week was as follows:

	Low	High		Low	High
Allis-Chalmers ..	45 1/4	46 1/2	Lima Loco.	66	67 1/4
Am. B. S. & Fdy. 77	80 1/2	Midvale Steel ..	28 3/4	29 1/4	
Am. Can.	103 1/2	Nat. Acme ..	7 1/2	9	
Am. Can pf.	109 1/8	Nat. En. & Stm. ..	39 1/4	41 1/2	
Am. Car & Fdy. 161	167	N. Y. Air Brake ..	40 1/4	41	
Am. C. & F. pf.	120 3/4	Otis Steel ..	9 1/4	9 1/2	
Am. Locomotive. 73 1/4	75 1/2	Otis Steel pf.	57	58	
Am. Radiator. 94	101 1/2	Pressed Stl. Car. ..	52 1/2	56	
Am. Steel Fdries. 37	38 1/2	Pressed Stl. pf.	82 1/2	83	
Am. Stl. Fd. pf.	102	Rephlogle Steel.	11	12 1/2	
Bald. Loco.	122 1/2	Republic ..	50 1/4	51 1/2	
Bald. Loco. pf.	111	Republic pf.	88 1/2	89	
Beth. Steel ..	53	Sloss-Sheffield ..	59	61 1/4	
Beth. Stl. 7% pf. 90 1/2	91	Steel of Canada ..	74 1/4	77	
Br. Em. Stl. 2 pf. 15	15 1/2	Superior Steel.	31 1/2	31 1/4	
Chic. Pneu. Tool 83	83 1/2	Un. Alloy Steel.	30 1/2	33 1/2	
Colo. Fuel	24 1/4	U. S. Pipe.	65 1/4	75 1/2	
Crucible Steel ..	65 1/4	U. S. Pipe pf.	85	86 1/2	
Deere pf.	69	U. S. Steel.	98 1/4	100 1/2	
Gen. Electric. 193 1/2	200 1/2	U. S. Steel pf.	119	119 1/2	
Gt. No. Ore Cert. 28 1/2	29	Vanadium Steel.	29 1/2	31	
Gulf States Steel 80 1/2	84	W'house Air Br.	83	85	
Inland	36	Y'gstown S. & T.	68	69 1/2	
Int. Har.	77				

Joseph E. Thropp Co., Inc., in Receivership

The Joseph E. Thropp Co., Inc., owning the Earliest furnace at Everett, Pa., and the two furnaces at Saxton, Pa., has gone into receiver's hands. Andrew S. Webb of Philadelphia having been appointed. Assets are listed at \$2,400,000 and liabilities at \$1,300,000, with quick assets of \$675,000. Difficulty in obtaining sufficient working capital and the slump last year in the prices of pig iron are given as causes for the receivership application. The business was reorganized a year ago with new capital invested. Joseph E. Thropp was elected president, Douglas S. Thropp, vice-president, and Andrew S. Webb of Charles J. Webb & Co., Philadelphia, treasurer.

Industrial Finance

William T. Rasmussen has been appointed receiver for the Duesenberg Automobile & Motors Co., Indianapolis, on a petition filed by the Acme Works, Inc., a creditor. Under the receivership the concern will continue to be operated and a reorganization of the company is expected. The petition said the company was indebted to a great number of material and parts concerns, and owed more than \$150,000.

The Wellman-Seaver-Morgan Co., Cleveland, has taken an order from the Alex Laughlin Co., Pittsburgh, for four of its new type of large gas producers to be installed at the plant of the Colonial Steel Co., Pittsburgh. Other recent orders taken by Wellman-Seaver-Morgan Co. include two coke pushers placed by the Koppers Co., one for installation in Winnipeg, Man., and one in Utica, N. Y., and a double drum electric hoist with drums 10 ft. in diameter and a 6-ft. face for the Woodward Iron Co., Birmingham, Ala.

The Pittsburgh and Conneaut Dock Co., a subsidiary of the United States Steel Corporation, has placed an order with the Wellman-Seaver-Morgan Co., Cleveland, for two 17-ton electric type Hulett ore unloaders to be installed at Conneaut, Ohio. These will be of the same capacity as the largest unloaders now in operation on some of the lake docks and will be generally similar in design, although having some improvements. The two unloaders will be installed on the present unloading docks at Conneaut, as the new dock that is now being built will not be completed for a year or more. Work on the unloaders will be rushed with a view of having them ready for operation in June.

The Canadian Car & Foundry Co. reports net profits for the year ended Sept. 30, 1923, of \$1,427,573, after depreciation, Federal taxes and interest, comparing with a net loss of \$586,632 in the preceding year. Profit and loss surplus amounted to \$3,567,148, against \$2,664,575 in the previous year.

The Crompton & Knowles Loom Works, Worcester, Mass., is to distribute 10,000 shares of common and a like amount of preferred stock to stockholders as a stock dividend.

A receiver, Judge James H. Walsh, Greenwich, Conn., has been appointed for the H. & H. Foundry Co., Stamford, Conn. William T. Macfarlane is president and Virginius J. Mayo, secretary-treasurer and manager.

Unfilled orders on the books of the Allis-Chalmers Mfg. Co., as of Dec. 1, last, were \$12,043,000, whereas on Nov. 1 they were \$12,200,000. The peak of 1923 was attained July 1, when \$13,140,000 business remained unfilled.

A special meeting of the stockholders of the Colonial Steel Co. has been called for March 4, at the company's general office, Keystone Building, Pittsburgh, to consider an increase in capital stock of from \$2,000,000 to \$5,000,000.

NEW TRADE PUBLICATIONS

Steam Hammers.—Morgan Engineering Co., Alliance, Ohio. A 24-page catalog devoted to hammers of various sizes, operated by steam. The hammers illustrated range from 150-lb. to 20-ton rating, the latter having a total weight of 913,000 lb. Three hammers of this latter size have been built, one having been shipped to England. The catalog includes tabular matter of dimensions of standard hammers, in addition to the special hammers shown pictorially, many of them in the plants where their work is done. Both single-stand and double-stand hammers are shown.

Centrifugal Pumps.—De Laval Steam Turbine Co., Trenton, N. J. 70-page catalog devoted to single-stage and multi-stage centrifugal pumps for all services for which water, oil and other liquids have to be handled. The subject is covered in great detail and some of the illustrations use colors for bringing out specific points. Not only are the pumps described, but also the turbines for driving them, the speed-reducing gears of double helical type, motor drives with direct connection, and drives by belt and rope. Most of the illustrations show equipment in service in manufacturing or other plants, including several water works units. At the end of the book will be found data of design, with the number of characteristic curves.

Efficiency Tests of Motor Driven Pumps.—De Laval Steam Turbine Co., Trenton, N. J. 16-page catalog giving details of tests of centrifugal pumps driven by electric motors and located at various plants in the United States and Canada. One page gives the monthly record for four years of a water works pump in Minneapolis operating with a head of about 250 ft. The average efficiency shown month by month, from switchboard to water delivered, varied from 80.9 to 84 per cent.

Frederick Stoker.—Combustion Engineering Corporation, Broad Street, New York. Four-page pamphlet devoted to a multiple retort underfeed stoker designed for both central station and super-station use. Each ram is designed to feed 20 lb. of fuel per stroke. The gear box permits variation in rate of operation. A secondary ram which tuyères for admission of air is said to give greater fuel burning capacity and better air distribution through the fuel bed.

Pulverized Coal for Boilers.—Fuller-Lehigh Co., Fullerton, Pa. 32-page catalog devoted to the machinery and equipment for pulverizing and handling coal for boiler use. This covers the crushing, separating, drying, and transmission of the coal and its blowing into the furnace under a definite pressure. The burners constitute the last item of the system, these being of several types, both horizontal and vertical. Numerous illustrations, including diagrams, together with a certain amount of tabular matter, make the publication of use for reference.

High-Temperature Heat Insulation.—Philip Carey Co., Lockland, Cincinnati, Ohio. 8-page bulletin No. 101 devoted to insulation for temperatures exceeding 500 deg. Fahr. At that temperature carbonate of magnesia begins to decompose, making it necessary to furnish a new high-temperature insulation for use up to 1000 deg. Tests of this "hi-temp" pipe covering are given, showing a high insulating efficiency and a resistance to mechanical deterioration at high temperatures.

Equipment for Producing Pulverized Material.—Fuller-Lehigh Co., Fullerton, Pa. 24-page pamphlet devoted to pulverizing and drying machinery, as well as conveying equipment, for handling a large number of different types of materials, including coal, ore, cement, lime, marble, slag, slate, etc. The pamphlet is well illustrated and carries tabular matter covering capacities, etc.

Maximum Results from Fuel Oil.—Morse Dry Dock & Repair Co., 17 Battery Place, New York. 32-page pamphlet devoted to a fuel-oil burning system, including complete combustion engineering service. The pamphlet is devoted to the details of the system which has been developed and has been in use for some years in marine work and is now being extended to industrial work. Both steam and mechanical atomizing are included and the arrangement may provide either natural or forced draft. Auxiliary air for forming the cone of spray enters through central orifices. Tables and formulas covering combustion matters occupy eight pages in the book.

Current Metal Prices

On Small Lots, Delivered from Merchants' Stocks, New York City

The following quotations are made by New York City warehouses.

As there are many consumers whose requirements are not sufficiently heavy to warrant their placing orders with manufacturers for shipments in carload lots from mills, these prices are given for their convenience.

On a number of items the base price only is given, it being impossible to name every size.

The wholesale prices at which large lots are sold by manufacturers for direct shipment from mills are given in the market reports appearing in a preceding part of THE IRON AGE under the general heading of "Iron and Steel Markets" and "Non-Ferrous Metals."

Iron and Soft Steel Bars and Shapes

Bars:

Refined iron bars, base price	3.54c.
Swedish charcoal iron bars, base	7.00c. to 7.25c.
Soft steel bars, base price	3.54c.
Hoops, base price	5.19c.
Bands, base price	4.39c.
Beams and channels, angles and tees, 3 in. x 1/4 in. and larger, base	3.64c.
Channels, angles and tees under 3 in. x 1/4 in., base	3.54c.

Merchant Steel

Per Lb.

Tire, 1 1/2 x 1/2 in. and larger	3.60c.
(Smooth finish, 1 to 2 1/2 x 1/4 in. and larger)	4.10c.
Toe-calk, 1/2 x 3/8 in. and larger	4.60c.
Cold-rolled strip, soft and quarter hard	7.50c. to 8.50c.
Open-hearth, spring steel	4.50c. to 7.50c.
Shafting and Screw Stock:	
Rounds	4.40c.
Squares, flats and hex.	4.90c.
Standard tool steel, base price	15.00c.
Extra tool steel	18.00c.
Special tool steel	23.00c.
High speed steel, 18 per cent tungsten	75c. to 80c.

Tank Plates—Steel

1/4 in. and heavier	3.64c.
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Sheets

Blue Annealed	Per Lb.
No. 10	4.34c.
No. 12	4.39c.
No. 14	4.44c.
No. 16	4.54c.

Box Annealed—Black

Soft Steel C. R., One Pass Per Lb.	Blued Stove Pipe Sheet Per Lb.
Nos. 18 to 20	4.40c. to 4.70c.
Nos. 22 and 24	4.45c. to 4.85c.
No. 26	4.50c. to 4.90c.
No. 28	4.60c. to 5.00c.
No. 30	4.80c. to 5.20c.
No. 28 and lighter, 36 in. wide, 20c. higher.	

Galvanized

Per Lb.
No. 14
No. 16
Nos. 18 and 20
Nos. 22 and 24
No. 26
No. 27
No. 28
No. 30
No. 28 and lighter, 36 in. wide, 20c. higher.

Welded Pipe

Standard Steel	Wrought Iron
Black Galv.	Black Galv.
1/2 in. Butt... 41	24
2 1/2 in. Butt... 46	32
1-3 in. Butt... 48	34
2 1/2-6 in. Lap... 44	30
7-8 in. Lap... 41	11
9-12 in. Lap... 34	6
1/2 in. Butt... 4	4
2 1/2-6 in. Lap... 5	14
7-8 in. Lap... 2 1/2-6 in. Lap... 9	9
9-12 in. Lap... 7-12 in. Lap... 3	9
1/2 in. Butt... 11	9
2 1/2-6 in. Lap... 14	6
7-8 in. Lap... 9	9
9-12 in. Lap... 3	9

Steel Wire

BASE PRICE* ON NO. 9 GAGE AND COARSER	Per Lb.
Bright basic	4.75c. to 5.00c.
Annealed soft	4.75c. to 5.00c.
Galvanized annealed	5.40c. to 5.65c.
Coppered basic	5.40c. to 5.65c.
Tinned soft Bessemer	6.40c. to 6.65c.

*Regular extras for lighter gage.

Brass Sheet, Rod, Tube and Wire

BASE PRICE

High brass sheet	17 1/2c. to 18 1/2c.
High brass wire	18 1/2c. to 19 1/2c.
Brass rods	15 1/2c. to 16 1/2c.
Brass tube, brazed	25 1/2c. to 27 1/2c.
Brass tube, seamless	22 c. to 23 c.
Copper tube, seamless	23 1/2c. to 24 1/2c.

Copper Sheets

Sheet copper, hot rolled, 21c. per lb. base.

Cold rolled, 14 oz. and heavier, 3c. per lb. advance over hot rolled.

Tin Plates

Bright Tin

Coke—14 x 20

Grade "AAA"	Grade "A"	Prime	Seconds
Charcoal	Charcoal	80 lb..	\$6.55
14x20	14x20	90 lb..	6.65
IC.. \$12.55	\$10.70	100 lb..	6.75
IX.. 13.95	12.55	IC..	7.00
IXX.. 15.55	13.75	IX..	8.25
IXXX.. 17.10	15.30	IXXX..	9.50
IXXXX.. 18.85	16.80	IXXXX..	10.75
		12.00	10.75

Terne Plates

8 lb. coating, 14 x 20

100 lb.	\$7.00 to \$8.00
IC	7.25 to 8.25
IX	8.25 to 8.75
Fire door stock	9.00 to 10.00

Tin

Straits pig	50c.
Bar	58c. to 60c.

Copper

Lake ingot	15 1/2c.
Electrolytic	15 1/2c.
Casting	14 1/2c.

Spelter and Sheet Zinc

Western spelter	7 1/2c.
Sheet zinc, No. 9 base, casks	10 1/2c. to 11 1/2c.

Lead and Solder*

American pig lead	9c. to 9 1/2c.
Bar lead	11c. to 12 1/2c.
Solder 1/2 and 1/4 guaranteed	34 1/2c.
No. 1 solder	32 1/2c.
Refined solder	28 1/2c.

*Prices of solder indicated by private brand vary according to composition.

Babbitt Metal

Best grade, per lb.	75c. to 90c.
Commercial grade, per lb.	35c. to 50c.
Grade D, per lb.	25c. to 35c.

Antimony

Asiatic	11 1/2c. to 12 1/2c.
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Aluminum

No. 1 aluminum (guaranteed over 99 per cent pure), in ingots for remelting, per lb.	36c.
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Old Metals

Business in most items continues quiet except scrap lead and aluminum, which are active. Dealers' buying prices are as follows:

	Cents Per Lb.
Copper, heavy crucible	11.00
Copper, heavy wire	10.25
Copper, light bottoms	9.00
Brass, heavy	6.00
Brass, light	5.00
Heavy machine composition	8.75
No. 1 yellow brass turnings	6.00
No. 1 red brass or composition turnings	8.00
Lead, heavy	6.50
Lead, tea	5.50
Zinc	4.00
Cast aluminum	16.50
Sheet aluminum	16.50